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PURATATTVA

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BOOK REVIEWS

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Editorial

For this issue of Puratattva, the articles were received from various sources, as range from prehistory to historical archaeology. A perceptive paper in this number is about the work of Indian archaeologists regarding the conservation and preservation of Angkor Vat Temple in Kampuchea. As usual the contribution from younger generation is quite heartening seeing their aptitude in synthesizing and analysing their data All illustrations, the line drawings or plates in this issue are by the courtesy of the institutions to which respective contributors belong.

It is seen that papers for inclusion in Puratattva reach us late. It is fair that contributions should reach us by end of June to let us process them in a better and effective manner.

This publication is brought out largely due to the financial grant from Archaeological Survey of India and Indian Council of Historical Research. We acknowledge with thanks the assistance of these institutions. Much of the credit goes to Prof C. Mani of Mussoorie who has helped in various ways for bringing out this number. We will be failing in our duty if we do not express our sincere thanks to Shri Manish Chandra for bringing out this volume.

The archaeological world has lost the stalvarts - Professors K.D.Bajpai, K K. Sinha, George Dales, K.T M. Hegde and Upendra Thakur and the Indian Archaeological Society conveys its deepest condolences to the bereaved families.

We would like to inform, again, about the forthcoming World Archaeological Congress (WAC-3) to be held in India in December, 1994. Members of the Society are requested to get themselves enrolled in the WAC chapter in India and for further details write to Indian Convenor, C/o Indian Archaeological Society, Janpath, New Delhi-110011.

OBITUARIES



Prof. K.D.Bajpai

Professor K.D.Bajpai, the renowned scholar of Ancient Indian History, culture and Archaeology passed away in Sagar on 10th June. He retired as Head of the Department of Ancient Indian History, Culture and Archaeology from Sagar Unversity in 1977.

He has to his credit 46 Books and more than 900 research papers on various aspects of Indian art, architecture, history, culture, archaeology, Numismatics, epigraphy, Pre and Proto-history.

Born in 1917 at Raipur, a village of Raibarely district in U.P., he was educated at Raibareli, Kanpur and Varanasi. Professor Bajpai started his career as Custodian of Mathura Museum in 1944. After serving in various posts in the Archaeology Department of Uttar Pradesh he joined Sagar University in 1958 as Head of the Department of Ancient Indian History, Culture and Archaeology. He was elected as the President of various learned bodies including Indian History Congress, All India Oriental Conference, Indian Archaeological Society, Indian Numismatic Society, Indian Epigraphic Society and Indian History & Culture Society. He Served as Member of the Indian Council of Historical Research, Central Board Of Archaeology, Central Hindi Terminology Commission.

Prof. Bajapi was honoured by Nelson Wright Medal award of International repute and the R.P.Chanda award for his reaearches in the field of Numismatics.

Prof. Bajpai's sad demise has shocked his admirers and students alike. It is an irrepairable loss to the scholarly world.



George Franklin Dales, Jr.

George Franklin Dales, Jr. was born 13 August 1927 in Akron, Ohio, and died at home in Berkeley, California, after a long illness on 18 April 1992. Professor of Archaeology at the University of California, Berkeley, for twenty years, Dr. Dales received his B.A. in Classics from the University of Akron in 1953 and his Ph.D. in Oriental Studies from the University of Pennsylvania in 1960. He subsequently taught at the University of Toronto, Canada, and at the University of Pennsylvania before moving to Berkeley in 1972. There he was a valued member of the Department of Near Eastern Studies before shifting to the Department of south and Southeast Asian Studies, an affiliation that was more in keeping with his teaching and research interests.

Professor Dales began his distinguished fieldwork career in 1957 at the Mesopotamian site of Nippur where he served as Assistant Archaeologist and Photographer. His 1962 article in Archaeology magazine with Donald P. Hansen on the Ianna temple reflects these early interests, as does his 1960 Ph.D. dissertation on Mesopotamian and Related Female Figurines. Even by 1959, however, George Dales had begun what was to become his life's work on the eastern margins of the Middle East. At the urging of Samuel Noah Kramer, who believed that the ancient geographic term "Dilmun" could be equated with the Indus Valley, he undertook the surveys first in the Bandar Abbas area of southern Iran in 1959 and then in 1960-with his wife Barbara, T. Cuyler Young, Jr., and M. Rafique Mughal-along the Makran coast of Pakistan by

boat, camel, and on foot. Although two articles appeared 1962, the definitive publication of this pioneering survey, in the form of Professor Dales before his death. It will be published by the Archaeological Research Facility of the University of California, Berkelely, in late 1992.

Between 1960 and 1963, George Dales joined field projects at Nippur, in Jerusalem (under Kathleen Kenyon), and at Qasr Ibrim in Egyptian Nubia. Then in 1964-1965 he carried out a season of what were to be the last (to date) full-scale research excavations at Mohenjo-daro in a zone west of HR area. He was working on the second volume of the final report of these operations at his death, the first (on the pottery) having been published by the University Museum in 1986, co-authored by his student Jonathan Mark Kenoyer.

In 1966 and 1967, Professor Dales travelled widely in South and Southeast Asia and then, in 1968, he began two seasons of site survey in Afghan Seistan, with a third season to take place during his sabbatical year in Afghanistan in 1971-1972. He also put a sounding into the first millennium BC site of Nad-i Ali (published in 1977). In this period he found time to direct training excavations for Thai students at the early Buddhist site of Chanasen, Thailand (1968 with Bennett Bronson) and to serve as Project Director for the University Museum's excavataions at Kantarodai and Poparippu in Sri Lanka (1970 with Vimala Begley).

In 1973, after his move to Berkeley, George Dales was back in Pakistan to begin four seasons of excavation at the small Harappan and pre-Harappan site of Balakot located near the coast about 50 miles northwest of Karachi. Working with him starting in 1974 to begin their careers in South Asian archaeology were Jonathan Mark Kenoyer and Richard H. Meadow, both of whom were also to join him later at Harappa. Following the Balakot excavations, he worked on documenting the finds from Mohenjo-daro and Balakot, and then in 1985 negotiated with the Department of Archaeology, Government of Pakistan, a license to begin work at Harappa in 1986. These new excavations were to focus on the Harappan phase cemetery, the transition from the Early Harappan to the Harappan, and the sturcture of the never yet explored area of Mound E. Professor Dales continued to actively direct the project down to the last excation season in 1990 and into the study seasons that followed.



Prof. K.K. Sinha

Born on August 8, 1929, *Prof. K.K. Sinha* breathed his last on the night of July 1, 1992 due to cardiac arrest at Bombay. Prof. Sinha Post-graduated in Sanskrit from the Allahabad University in 1950 and obtained his Ph.D. Degree in Archaeology in 1963 from the University of London, U.K.

Prof. Sinha worked in the Archaeological Survey of India in different capacities from October 1950 to January 1965 and gained experience and expertise in Archaeological Excavations and Explorations as also in Preservation and Administration of Ancient Monuments. He joined the Banaras Hindu University in February, 1965 as Reader in Archaeology and was appointed Professor of Archaeology in April 1973 where he was teaching and supervising Ph.D. schoolars besides conducting his own researches till his retircment in August 1989. He directed excavations at Sravasti, Bhitari, Khairadih and Kampil. His area of specialisation was Protohistoric and Historic archhaeology. He was Co-ordinator of the Ford Foundation Project of the Department of AIHC. & Archaeology, Banaras Hindu University till his retirement in August 1989.

Prof. Sinha was a widely travelled person and was also the member of many learned Societies. He was the member of the Central Advisory Board of Archaeology.

In the passing away of Prof. K.K. Sinha, the country has become poorer in losing one of its champions of Indian Archaeology and the void left by him in this field of study, will be difficult to fill up in the future years to come.

Archaeology of South Asia : A Perspective in Interrelationship

B.K. THAPAR

1. South Asia as land mass comprises Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh, Sri Lanka and the Maldives. Excepting Afghanistan, these countries fit into the political definition of SAARC. As cultures often transcend political frontiers, in our discussion we would necessarily have to include what till recently was called Soviet Central Asia including Bactria and Margiana and Iran which were a part of the culture zone of South Asia, being also in contact with the classical world as a result of the incursions of Alexander the Great. In fact, between the Oxus and the Indus, the vast upland arid region, known as the Iranian plateau, witnessed major cultural development during the proto-historic period. Within the framework of Thomsen's Three Age System of Stone, copper-Bronze and Iron, the present paper, in the Indian context, would dwell upon three cultures for interrelationship: the Neolithic, the Harappa or the Indus Civilization and the megalithic. During the historical period, however, there are admittedly many other areas of interrelationship, particularly Buddhism and Achaemenid and Graeco-Bactrian influences which, being already extensively researched, are not dealt with here.

2. *The Neolithic Culture : the first farmers*

2.1 As a theoretical premise we hold that at the beginning of the Holocene some 12, 000 years ago, all the regions of the world stood at the same level of economic and social development with population of hunter gatherers. At the same time it is noted that the regional groups lived in different environmental conditions, drew on various resources, and specialized in various activities. Acceleration resulted in a selection of those activities which provided the best output. Food conservation strategies leading to cereal agriculture and raising of sheep, goat and cattle seemed to be the best choice in terms of economic subsistence and were made possible in those ecological areas where the ancestors of cereals and animals mentioned above were indigenous. At the same stime it must be recognized that domestication of animals and plants are processes rather than events. The linear idea of origins of agriculture does not hold good everywhere. Agriculture was only one of the options existing in the variegated environmental mosaic of south west Asia during adaption to post-Pleistocene conditions. After the pioneer work of Robert J. Braidwood at Jarmo in Iraqi Kurdistan for quite some time the origin of agriculture remained anchored to the hillsides of the Fertile Crescent. During the last three decades, however, field work in areas outside the Fertile Crescent have offered alternatives to this postulate whereby we can recognize independent origin of agriculture or transformation from food-gathering to food producing economy in many years of South Asia. Within the scope of this paper, we shall focus on the findings in Afghanistan, Turkmenia, Tadjikstan, Iran, Pakistan, Sri Lanka and India.

2.2 Afghanistan has given us so far five neolithic sites: Aq Kupruk I (Ghar-i-Mar), Aq Kupruk II (Ghar-i-Asp) Darra-i-Kur, Hazar Siun and Gurzuvan. Amongst these, the material from Aq Kupurk is considered as the workable index for the region. At this site both the aceramic and ceramic phases of the neolithic culture have been indentified wherein both stone and bone tools were used. the lithic industry includes sickle blades with sheen on edges. Sheep and goat seem to have been domesticated. There is no floral evidence for the domestication of plants, but the presence of sickle blades with sheen may be taken to offer the archaeological evidence of this phenomenon. No remains of built architecture as such have been recovered; natural caves were

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selected for habitation. The ceramic industry was a crude chaffcrushed limestone tampered ware. On the basis of C.14 determinations aceramic phase falls between 8,500 and 7,000 B.C. and the ceramic between 7,000 and 3,000. The chronological horizon shows that Afghanistan was one of the many centres for the independent origin of neolithic culture in the region.

2.3 In the Turkmenian republic of Soviet Central Asia, the territory in question is in a zone of dry sub-tropical climate. the earliest neolithic phase belongs to the Djeitun Culture and the Namazga Period I, extending from the sixth to middle of the fourth millennium B.C. Sedentary farming sites are concentrated exclusively in the northern foothills of the Kopet Dagh. Unmistakable agricultural implements like inset-blade sickels for harvesting grain-hullers, mortars, pestles and grindstones have been found in the settlements of the Djeitun Culture. For cultivation of soil, however, no implements were found. The reason for their absence probably lies in the nature of the soil, which being light in physical composition, could have been easily worked with wooden hoes. The domestication of animals was attested. The ceramic comprised a crude handmade ware. The sites of Djeitun Culture are situated in the area of the distribution of *Aeqilops squarrorsa*, a weed supposed to have hybridized with *Triticum boeticum* to form *Taestivum* or the bread wheat. Bread wheat which is first recognized at a surprisingly late date in west Asia may first have been domesticated by Djeitun related peoples in north-eastern Iran or south-western Turkmenistan. As far as Iran is concerned, work at Tepe Sang-e-Camaq on the Iranian plateau near Shahrud and Yarim Tepe near Gonbad-i-Gabas extend the Djeitun Culture back possible to mid seventh millennium B.C.

2.4 In Soviet Central Asia, within the mountainous area of southern Tadjikstan, the Hissar Culture represented the change to domestication through adptive intensification. The neolithic horizon of Hissar Culture falls chronologically between the 8020±170 and 6760±110 B.C. Pottery was not used until the end of the period which is by no means early when compared with the incidence of pottery in the regions farther south on the Iranian plateau where it had appeared over a thousand years earlier. The ohter neolithic phase was represented by the Kelteminar Culture, found in the great clayey plain formed by erratic delta of the Amu Darya (river Oxus) along the southern edge of lake Aral. Chronologically, the Kelteminar Culture persisted for atleast a millennium years after the end of the Hissar Culture. Like its contemporaries in the moutainous regions the Kelteminar people practised mixed economy with incipient food production. Domestic animals constituted a part of their needs. The importance of domesticated plants increased after 4500 B.C. when pottery was also introduced.

2.5 Coming to Pakistan, we have a complete sequence from Mehrgarh, a site located on the mouth of the Bolan Pass. Here, the sequence extends from and aceramic stage, through ceramic neolithic to the Bronze Age, the earliest occupation going back to the early seventh millennium B.C. Evidence of domestication of both animals and plants was available as also the existence of mud brick architecture. Amongst finds, terracotta figurines in the form of mother goddesses were also found. In the same area, another site Kile Gul Mohd was earlier excavated with the same sequence but its date, based on C.14 determinations, did not go earlier than fourth millennium B.C.

2.6 As far as India is concerned six neolithic regions have been identified. Amongst these, the Kashmir region and the Belan valley have added significantly to our existing knowledge, both in terms of material culture and also subsistence economy. While the Kashmir Neolitic Culture, represented by the sites of Gufkaral and Burzahom, provides evidence of a distinct aceramic stage of the Culture, the Belan Valley Neolithic Culture (through discoveries at Chopani Mando, Koldihawa and Mahagara) indicates a continuous sequence from the stage of intensified food-gathering and selective hunting (epi-palaeolithic) through incipient food production (advanced mesolithic or proto neolithic) to settle village farming (neolithic). The evidence, first of its kind in India, dispels the notion of the diffusion of neolithic traits either from West Asia or south-east Asia and establishes the primacy of the Neolithic culture of the Belan valley, especially in the light of the proposed chronology (seventh-fifth millennium B.C.). In the remaining four neolithic regions (Upper Ganga, Norht-eastern, Central-eastern and Southern) neither any aceramic nor the stage of transfromation from food gathering to food producing has been recognized. Furthermore, none of these is dated earlier than second quarter of the third millennium B.C.

2.7 In Sri Lanka, no distinct neolithic phase has so far been identified. the Stone Age sequence of the Mesolithic passes directly into the Iron Age historical period. Apart from the absence of the neolithic in this interrugnum period there is no proper Copper-bronze Age either. The phenomenon is rather unexplainable at this stage of research. Future investigations may perhaps fill this gap.

3. *The Bronze Age Cuture : the urban societies*

3.1 Towards the end of fourth millennium B.C. there was a radical economical re-orgainzation of these lands into proto state structures. The population tended to concentrate into early urban agglomerates with intensive agriculture and expansion of the Industrial sector. We thus find a series of local urban civilizations flourishing in the broad region located between Mesopotamia on the one hand and the Indus-Hakara system on the other: the Indus Civilization in the Indo-Pak sub continent, the Namazga Civilization represented by the urban societies of south-western Turkmenistan and north-eastern Iran and the Oasis Civilization of Bactria and Margiana. Excavations in Iranian Seistan also indicate the existence of a large cultural nexus, with Shahr-i-Saktha as the centre.

3.2 All these civilizations shared some ecological features in the sense that their area of spread lay in arid and semi-arid regions and at the same time had the advantage of fertile river valleys. In the case of the Indus Civilization it was the Indus system with its tributaries as also the ancient Sarsvati (Hakra-Nara system). In the case of the Turkmenian and Iranian sites it was the fertile interplains of the Caspian and intermountaine valleys of the Kopet Dagh, formed by the Tedjen, Gorgan, Lower Atrek and its tributaries and the narrow, more sparsely watered western Atak. The Tedjen and the Murghab effectively formed a "little central Asian-Mesopotamia" that was considered the most prosperous area in ancient times. And in the case of the oasis Civilization it was the former Murghab delta and the northern Bactrian plains of the Oxus which are less familiar to archaeologists. The development of these fluvial lands was linked to progress in social organization and in the evolution of techniques for controlling and channeling water courses. The Turkmenian urban culture was the logical culmination of the socio-economic evolution of the local communities of the settled agriculturists of the sixth to fourth millennium B.C. (Djeitun and Namazga complex). In the like manner the role of Mehrgrah and the other Baluchi hill cultures can be assesed for the make up of the Indus Civilization.

3.3 That these three civilizations were at a time contemporary and shared numerous material cultural traits is evidenced by the findings at sited of the Indus Civilization in Indo-Pak continent, Altyn Tepe in Turkemenia and Shortugai in Afghanistan. Altyn Tepe provides evidence in the form of what appears to be a large cult centre with a four-tiered pyramid along the lines of Mesopotamian ziggurat. Frequently occuring signs on terracotta statuettes show series of analogues with proto Elamite and proto-Sumerian script. Along with these were found two seals, one bearing Indus characters and the other a swastika depicted with double lines within a square, the latter from a ritual complex and the former from elite quarters, and ivory sticks and gaming pieces closely resembling those from the Indus Civilization. What is more significant to note is the occurrence of Indus related material over a long period of time. Altyn Tepe, being situated on the north-eastern periphery of the ancient near Eastern Civilization could thus maintain contacts with both Mesopotamia and the Indus Civilization.

3.4 The Bronze Age settlements in the ancient deltaic plain of Murghab river seem to represent the ancient land, mentioned in Behistum inscriptions as 'the land of Margush' The material culture of these sites relates to Namazga V and VI Periods. There is reason to believe that the first settlers came from the south-eastern foothills of Kopet Dagh, possibly even from Altyn Tepe. Distinctive finds from these sites are the terracotta figurines and seal amulets. Interestingly, the seal amulets from Murghab sites and from Chanhu-daro (Jhukar Culture) seem to share common origin. There are quite a few iconographic similarities between the glyptic art of the Indus Valley and that of Margiana and Bactria. One may reasonably argue that the Jhukar seals along with those of Murghab style originated in the West, perhaps with a centre in Susiana.

3.5 Shortugai lies on the plain where the Amu Darya enters the Afghan Tadjik lowlands and is joined by the two tributaries, the Kokcha and the Qizilsu. It offers the only access route to lapis lazuli mines of Sar-i-Sang in Badakshan. The earliest strata at the site yielded remains of the Indus Civilization in a homogenous complex which include all the salient features of the Civilization such as pictorgraphic script, baked steatite seals, carnelian beads, shell bangales and black-on-red painted pottery in distictive desings and shapes. This occupation of the Indus Civilization at Shortugai is dated between 2400 and 2200 B.C. (based on C.14 calibration), which would mean that Harappan presence in Bactria manifested itself in the early phase of its development in its core area. This contact of the Indus Civilization thus seems to have occurred before the flowering of Bactria.

3.6 The recently excavated sites of Sapalli Tepe and of Dashli oasis provide a broad definition of Bactrian Bronze Age. The Bronze Age culture of Margiana and Bactria seem to be closely related culture-historically. The cultural remains from the Bactrian sites have no point of reference in the preceding cultures of the Afghano-Tadzik lowlands

but correspond perfectly to the chalcolithic forms and techniques of southern Turkmenia and northern Baluchistan which in fact were variants in the great East Iranian complex. Recently, J.F. Jarriage has offered the stimulating suggestion that the Bactrian Bronze Age was influenced in its initial stages by the contemporary archaeological cultures in Baluchistan. His excavation at Sibri Damb and Nowsharo including that of a Cemetery, in close vicinity of Mehrgarh itself indicates a material culture with a near identity of the Bactrian Bronze Age, showing pottery related to the late Namazga V - early Namazga VI wares and figurines resembling those from the Kelleli oasis in the lower Murghab. The contending interpretations for the origin and growth of the Bactrian Bronze Age and functional interrelationship between the Harappans can be resolved through further research; current evidence, however, suggests a late third millennium date for the advent of the Namazga related peoples and 'Central Asians' in this region. Of the Indus Civilization itself, recent excavation at Dholavira in Kutch have added new dimensions to the understanding of the Civilization, particularly its layout, art and crafts, etc. which require a reappraisal of our understanding of the Civilization.

4. *The Iron Age Culture : the megalithic builders*

4.1 Lastly, I may mention about the Megalithic Culture. As far as south Asia is concerned, megalithic burials have been reported from some of the Gulf countries (south-eastern Arabia) as also from Sind (near Karachi) in Pakistan peninsular and extra peninsular region of India and the northern parts of Sri Lanka.

4.2 Apart from this it would perhaps be relevant to recall that megaliths have a widespread distribution both in Europe and Asia including Japan, Korea, China, Indonesia and Malaysia. The striking similarities in structural form in disparate regions do stir imagination, perhaps for a common source at least of concept. The significance of this apparent interrelatioship cannot yet be appraised, for the associated cultural remains including chronology of the megalithic burials of each of these regions is found to be different. The European megaliths belong to the neolithic and chalcolithic assemblages, falling between circa 5000 and 2000 B.C., while those of Indo-Pak subcontinent appropriate to the Iron Age within a range of first millennium B.C. The megalithic burials of east and south-east Asia began essentially with the Bronze Age of that region and continued till the beginning of the Iron Age, covering a period circa eighth - third century B.C.

4.3 As far as the megalithic burials of the peninsular India and Sri Lanka are concerned these seem to belong to common cultural tradition, sharing almost all cultural traits including the chronological span. Many theories have been put forward for their origin, but a consistant programme of research is needed to solve the problem including that of their authors.

5. *Conclusions*

5.1 It would be seen that during the seventh-third millennium B.C. when these regions were passing through neolithic phase, there was little active interrelationship between them, for their subsistence economy was admittedly condtioned by their local environment and their capacity to explit its resources. During the third-second millennium B.C. expansion of mercantile activities led to cultural interrelationship between these regions. The structure of the societies became complex with the inclusion of trade and craft. Each of these regions lacked in one resource material of the other and was thus dependent upon the other whether it was semiprecious stones or metal or ivory or chorite. Trade became the most successful economic strategy for these regions; agriculture was a dead-end as far as economic development was concerned. Along with goods the most important exchange was that of ideas. Wheeler had at one time stated that 'ideas have wings'. The idea of civilization was in the air in this broad region during the third millennium B.C. The concepts of monumental architecture and system of writing took different shapes in different regions dependent on *genius locii*. As a projection of the same premise of the exchange of ideas it is reasonable to argue that megalithic burials may also be seen as one example of this catalyst element.

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Interpretation of Function of Microlithic Tool (Lunate)Through Microwear Examination

GAYATRI CHATURVEDI

The paper embodies results of Microwear analysis of experimental tools used on different work materials for a variety of actions. An attempt has been made to interpret the wear marks found on microlithic lunates from archaeological collection. Based on the observation made on experimental tools, it is concluded that these lunates were used for cutting soft plants, meat, hide as well as some of them also used as barbs in arrows. Probably, these tiny pieces were hafted and then used. Thus, microwear analysis is very helpful in interpreting the probable function of archaeological tools.

Introduction

One of the most important remains of the prehistoric man is in the form of stone tools, which are invariably found at all the sites in sufficient quantities. These stone tools are invaluable markers of human activities which are reflected in the form of use-wear marks on the working edge of the tools. These use-wear marks are often microscopic, thus need high magnification for analysis. The researches oriented towards the interpretation of the functions of stone tools with the help of use-wear analysis are known as microwear studies.

In order to interpret the significant patterns of the use-wear marks on the stone tools, control charts have been prepared with the help of a series of experiments. The control charts are made by replicating similar wear marks through presumed functions. In this paper, the experimental work which is more relevant for the study of lunates has been presented. A comparison of the known use-wear patterns of control charts with that of the wear patterns present on archaeological specimens, gives clues for the way in which the lunates were used and also the material which were processed by the artifacts of the early man.

The systematic study for the functional analysis of tools with the help of use-wear analysis was initiated by Semenov (1964). Thereafter, microwear analysis became an important way to determine the function of stone tools. Two important approaches of use wear analysis in the form of low magnification and high magnification studies were developed. A number of researchers have successfully applied these types of studies for functional analysis. Some of them are Tringheme *et al.* (1974), Keeley (1980), Odell-Vereecken (1980), Vaughan (1985).

Methodology

A. Sample selection- The archaeological samples were obtained from Laharia-dih rock shelter site in Mirzapur district of Uttar Pradesh. The site waw excavated by P.C.Pant and V. Jayaswal in the years 1977 and 1978 (Pant 1982). Later on, in 1979-80, a small trench 'C' was dug by V. Jayaswal where extra care was taken in the excavation to obtain the artifacts in undamaged conditions. The site has a cultural deposit of 125 cm and has three archaeological horizons. The lowermost layer-3, yielded an Upper Palaeolithic assemblage. The second layer revealeld microliths of both geometric and non-geometric types. the topmost layer belonged to a phase where microlithic tradition continued up to the later period, when wheel-made pottery and iron smelting activities were performed (Jayaswal 1982).

In the present paper, a single tool type-lunate has been selected from archaeological assemblage. These lunates are made on bladelets. the backed edge of the bladelets forms a crescent shape, while the sharp edge is usually straight and joins the curved back in the form of two pointed tips. Out of total 9 tools, the 8 lunates were obatained from layer 2, and 1 from layer 3.

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The author gratefully acknowledges Prof. P.C.Pant and V.Jayaswal, Department of Ancient Indian History, Culture and Archaeology, B.H.U., Varanasi, for providing the archaeological material and for their constant guidence. Thanks are also due to the Head of the department AIHC & ARCH and Ford Foundation for providing the facilities.

B. Cleaning of samples- The archaeological samples were first cleaned with soft detergent and water. Then these toolst were dipped into dilute HCL (10%) solution for 20-30 minutes. HCL removes lime and mineral deposits. Again, the tools were thoroughly washed with water to clean the acid. For removing any organic residues adhering on the tool, the tools were placed in KOH (10%) solution for 20 minutes, and then cleaned with fresh running water. After initial cleaning with acid and base, whenever the tool was observed under the microscope, it was cleaned with detergent and water. This was done to remove dust and hand grease present on the tool during examination.

C. Microscopic study- In the present work, low magnification study was done by using a Stereomicroscope with zoom, and reflected light attachment. the observations were done between 20 and 100 X magnification. For high magnification study, an Olympus metallurgical light microscope (BHM) was used with incident light attachment, and observations were done between 100 and 200 X magnification range. For recording the use-wear marks, photomicrographs were taken at 100 and 200 x magnification.

The microscopic observations of use-wear marks were classified in the following six categories :

1. Microchipping (scalar, hinge, step and crescent scar types), their location and amount,
2. Rounding of the edge and degree of rounding,
3. Polish, its type, location and spreading pattern,
4. Striation and abrasion marks, and their orientation,
5. Any other type of wear marks, and
6. Hafting evidence.

C. Experimentation- The experiments were conducted with a view to replicate the use-wear marks for preparing control charts. Experimental flakes were fabricated from Chert and Agate raw material by direct percussion technique. After that, morphologically similar flakes picked up for performing various actions, such as cutting, scraping, piercing, projectile etc. In each set of experiment, a fresh edge was used for individual action. It may logically be presumed that all the actions selected for this study were performed by the inhabitants of Laharia-dih rock-shelter using microlithic stone tools. Each action was performed for short duration (5 to 20 minutes) and long duration (30 to 120 minutes). With a view to bring out the relationship between the nature of the working edge and the density of wear marks, the experimental artifacts were divided into three categories, viz. artifacts with low edge angle (31^0-40^0), medium edge angle (41^0-60^0), and high edge angle (61^0-90^0).

The selected actions were performed on a number of work - materials. On the basis of their hardness, these work materials were grouped in 3 categories. these are - soft material (green grass, soft twig, fresh meat, fresh hide and dry hide), Medium hard material (hard green wood and dry wood), and Hard material (antler and fresh bone).

The experimental flakes were used in two ways, i.e. in unhafted position (118 experiments), and by hafting them into wooden base (27 experiments). Some of them are shown in figures 1 and 3. To obtain the comparable relults, experimental sampls were cleaned, observed microscopically and the recorded data were arranged in the similar way to that of the archaeological samples.

Observations

Some of the important observations of the experimental work are shown in Tables 1,2 and 3. The salient features are following -

1. In case of cutting action, use-wear scars and polish were located on both the dorsal and ventral surfaces of the working edge. Whereas, in case of scraping action, use-wear scars and polish were confined to the surface opposite to the contact side. In few exceptions, wear marks and polish appeared on both the surfaces of the utilized edge.

2. When the experimental tools were used on different worked material, some polish on their working edge was found when seen under the microscope. these polish are characteristic of the work material processed. Except in case of soft plant polish, the concentration of polish and use-wear scars varied in accordance with the duration of use of the tool. for example, in short duration of work, the development of polish is weak. As the duration of work increases, the intensity of polish increases, as well as the wear scars.

3. The extent and type of use-wear scars are affected by the nature of worked material. When the worked material is soft, wear scars are formed only after long duration of work. In case of hard worked materials, wear scars are formed very quickly.

4. Use-wear scars also depend upon the acuteness of the edge angle of the tool. Low edge angled tools wore off quickly and were not useful for further work. But medium edge andgled tool remained useful for a long time.

5. It was observed that low edge angled tools were suitable for ctting soft material, but not suitable for scraping action.

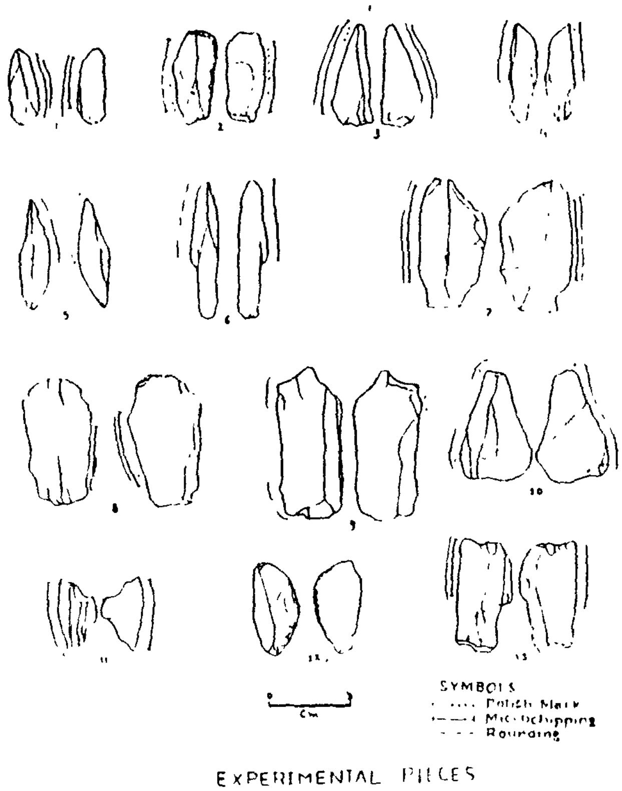

SYMBOLS
Polish Mark
Microchipping
Rounding
Cm
EXPERIMENTAL PIECES

Fig. 1

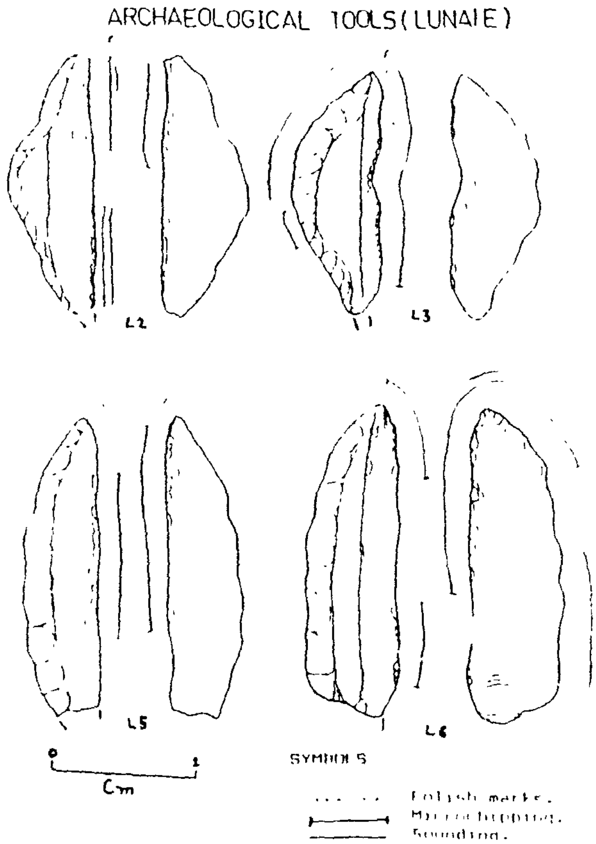

ARCHAEOLOGICAL TOOLS (LUNAIE)
L2
L3
L5
L6
Cm
SYMBOLS

Fig. 2

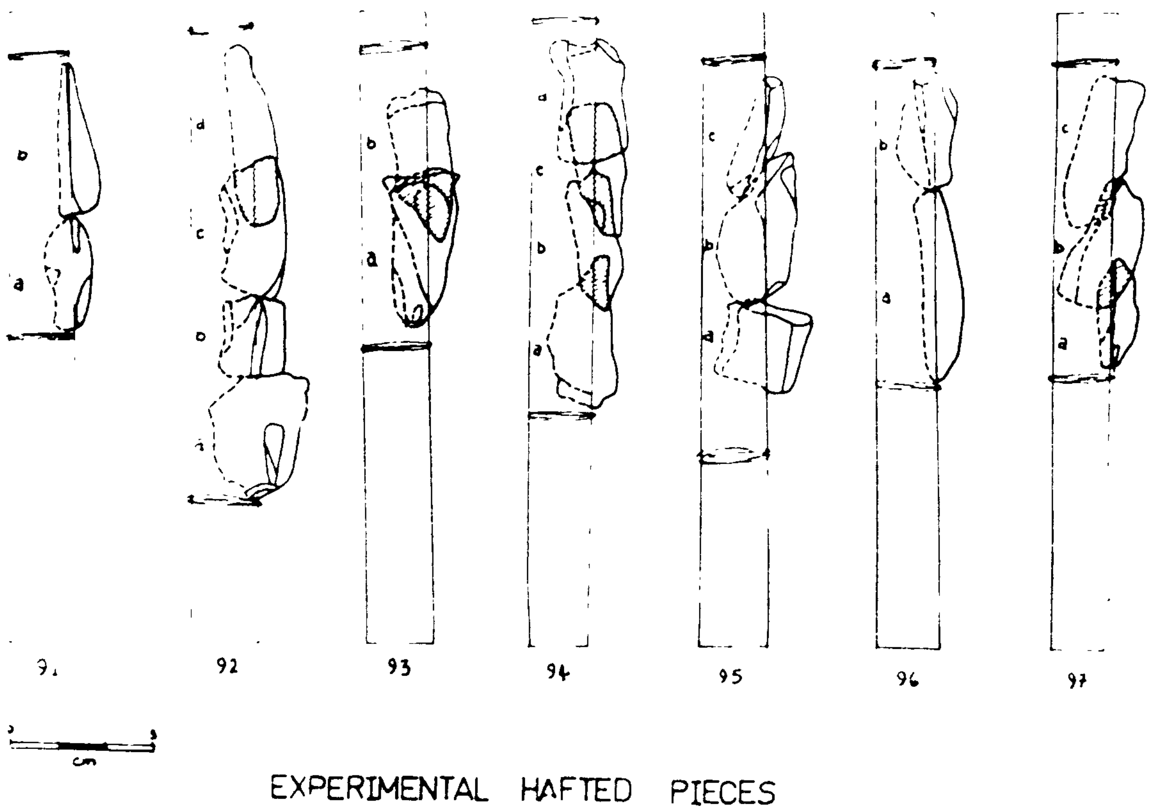


Fig. 3

Medium edge angle tools were useful for both cutting and scraping action on all type of worked material. High edge angle tools were useful for scraping hard material.

6. The state of worked material also affected the polish formation. In dry state, polish formation was very weak and use-wear scars were prominent Whereas fresh state of worked material produced polish in considerably less time.

Microwear Examination Of Archaeological Samples

Out of 9 lunates observed under microscope, polish and use-wear marks were found on 4 (L3, L2, L5, L6) (Table-4 and figure-2). Use-wear marks on these 4 lunates were located along the sharp edge starting from distal tip. Wear marks on the sharp edge were in the form of microchipping consisting of scalar, hinge and crescent scars on both distal and ventral surfaces. Other wear marks consisted of slight to heavy rounding of the edge and polish. The extent of these wear marks and polish were from distal tip to distal half of the sharp edge. The sharp edge in all the four cases were unretouched and had edge angle range between 38^0 and 45^0.

Bright polish spreading along the edge was found in two lunates (L2, L6). Polish had similarity with experimental tools used for cutting soft plants (Plates I-II). In one lunate (L5), dull polish, similar to meat/hide polish was found (Plates III & IV).

In one lunate (L3), wear marks on distal tip were prominent. Distal tip was slightly broken and 'spin off' removal was found on right edge dorsal surface. On the sharp edge, wear marks were located on distal half. On this lunate, dull and weak polish was found on dorsal surface along the sharp edge. Polish was found to spread up to the mid-ridge. these wear marks indicate that the tool was problably used for projectile action (as barb of an arrow), or for piercing action. The wear marks of this lunate have a similarity with the experimental tools used for projectile action.

In all the four lunates, wear marks were located on distal half of the tool. May be, these tools were hafted so that the lower half of the tools do not show edge wear. However, a clear evidence of hafting was not found. Sharp edges in all the cases were of low edge angle and unretouched, which are suitable for cutting soft material as per our experiments. In three lunates, the pattern of use-wear mark and spreading of polish were similar to experimental tools used for cutting action (Chaturvedi 1991).

Conclusions

On the basis of the above observation of archaeological specimens and comparing them with experimental results, it can be said that lunates were used for more than one purpose. Lunate was preferred for the use as blade/knife. It was used for cutting soft plants, meat/hide and other soft materials. Some of the pieces were used as barbs in arrow and also for boring soft materials. Though a clear evidence of hafting is not found, but on the basis of rounding of the curved backed edges, less wear on proximal half portion and obreakage of the proximal half portion, it can be presumed that these tiny pieces were hafted and then used.

Table1

Effect of Edge Angle, Worked Material and Time on Microwear Formation By cutting action. (% distribution).

Edge angle	Work Material	Time	Micro chipping	Slight Round	Heavy Rouond	Weak polish	Develop polish	Striation	No. of tools.
Low	SM	SD	75	50.0	-	41.7	25	-	12
Low	MM	SD	100	50.0	-	75.0	-	25	04
Low	HM	SD	100	66.7	-	33.3	-	-	03
Med	SM	SD	100	66.7	-	50.0	16.7	-	06
Med	MM	SD	100	50.0	-	66.7	16.7	-	06
Med	HM	SD	100	100.0	-	66.7	-	-	03
High	SM	SD	-	-	-	-	-	-	-
High	MM	SD	100	-	-	100.0	-	-	01
High	HM	SD	-	-	-	-	-	-	-
Low	SM	LD	100	33.3	66.7	33.3	66.7	-	03

Table1 *(Contd.)*

Effect of Edge Angle, Worked Material and Time on Microwear Formation By cutting action. (% distribution).

Edge angle	Work Material	Time	Micro chipping	Slight Round	Heavy Rouond	Weak polish	Develop polish	Striation	No. of tools.
Low	MM	LD	-	-	-	-	-	-	-
Low	HM	LD	100	-	100.0	-	100	100	01
Med	SM	LD	100	22.2	77.8	44.4	55.6	-	09
Med	MM	LD	100	28.6	57.1	-	100	14.3	07
Med	HM	LD	100	-	100.0	-	100	40.0	05
High	SM	LD	66.7	-	66.7	33.3	66.7	-	03
High	MM	LD	100	-	-	-	100	-	01
High	HM	LD	100	-	100.0	66.7	33.3	33.3	03

Total no of tools=67

SM	=	Soft worked material.	LD	=	Long duration.
MM	=	Medium worked material.	Low edge angle	=	31° - 40°.
HM	=	Hard worked material.	Medium edge angle	=	41° - 60°.
SD	=	Short duration.	High edge angle	=	61° - 90°.

Table 2

Effect of Edge angle, Worked Material and time on Microwear Formation By Scraping Action. (%distribution).

Edge angle	Work Material	Time	Micro chipping	Slight Round	Heavy Rouond	Weak polish	Develop polish	Striation	No. of tools.
Low	SM	SD	100	33.3	-	33.3	-	-	03
Low	MM	SD	100	100.0	-	100.0	-	100	01
Low	HM	SD	100	100.0	-	100.0	-	-	02
Med	SM	SD	50	33.3	-	16.7	-	-	06
Med	MM	SD	100	66.7	-	33.3	-	-	03
Med	HM	SD	100	40.0	20.0	100.0	-	20	05
High	SM	SD	-	50.0	-	100.0	-	-	02
High	MM	SD	100	-	-	-	-	-	01
High	HM	SD	100	100.0	-	60.0	20.0	40	05
Low	SM	LD	100	50.0	-	50.0	-	-	02
Low	MM	LD	100	-	100.0	-	100.0	-	01
Low	HM	LD	100	-	100.0	100.0	-	-	01
Med	SM	LD	83.3	41.7	58.3	50.0	41.7	-	12
Med	MM	LD	100	50.0	25.0	25.0	75.0	25	04
Med	HM	LD	100	-	100.0	20.0	80.0	60	05
High	SM	LD	100	-	100.0	-	100.0	-	03
High	MM	LD	100	-	100.0	-	100.0	-	02
High	HM	LD	100	20.0	80.0	20.0	60.0	20	05

Total number of tools = 63

Table 3

Location of Wear marks and Polish on Working Edge of tool (%distribution) Cutting and Scrapin Actions.

A - *CUTTING ACTION*

Edge	Worked	Micro Chipping				Polish			No.of tools
angle	material		DS	VS	BOTH	DS	VS	BOTH	
Low	SM	6.7	-	73.3	-	6.7	66.7	15	
Low	MM	-	-	100.0	-	-	75.0	04	
Low	HM	-	-	100.0	-	-	50.0	04	
Med	SM	20.0	-	80.0	6.7	6.7	73.3	15	
Med	MM	-	-	100.0	-	-	92.3	13	
Med	HM	-	-	100.0	-	-	87.5	08	
High	SM	33.3	-	33.3	-	-	100.0	03	
High	MM	-	-	100.0	-	-	100.0	02	
High	HM	-	-	100.0	-	33	66.7	03	

B - *SCRAPING ACTION*

Edge	Worked	Micro Chipping			Polish			No of tools
angle	material	CS	OCS	BOTH	CS	OCS	BOTH	
Low	SM	20.0	20.0	60.0	20.0	-	20.0	05
Low	MM	-	-	100.0	-	50.0	50.0	02
Low	HM	-	-	100.0	66.7	-	33.3	03
Med	SM	11.1	27.8	33.3	11.1	-	50.0	18
Med	MM	14.3	28.6	57.1	28.6	14.3	28.6	07
Med	HM	10.0	70.0	20.0	90.0	-	10.0	10
High	SM	-	20.0	40.0	20.0	-	80.0	05
High	MM	33.3	-	66.7	-	33.3	33.3	03
High	HM	10.0	40.0	50 0	60.0	10.0	10.0	10

Total No. of Tools = 130

DS	Dorsal Surface	OCS	Opposite to Contact Surface
VS	Ventral Surface	CS	Contact Surface

Table 4

Use Wear-Marks on Lunates.

Tool no.	Edge angle	Wear-marks on distal tip	Wear-marks along shrp edge on DS & VS surfaces	Polish along the sharp edge on DS & VS surfaces
L2	40	Slight break, Slight rounding	Scalar & hinge scars	Bright soft plant polish
L3	45	Slight break, "spin off" removal on DSRE.	Scalar, hinge and crescent scars	Dull unidentified polish

Table 4 ***(Contd.)***

Use Wear-Marks on Lunates.

Tool no.	Edge angle	Wear-marks on distal tip	Wear-marks along shrp edge on DS & VS surfaces	Polish along the sharp edge on DS & VS surfaces·
L5	38		Scalar & hinge scars Heavy rounding	Dull meat/hide polish
L6	45	Slight, break, Slight round few scalar scars.	Scalar and crescent scars	Bright soft plant polish.

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Rock Pictures in Orissa

NEUMAYER ERWIN

The earliest notices of rockpictures from orissa were published during the thirties, when the engravings and paintings from the Vikramkhole shelter caught much scientific interest (Jayaswal 1933:58; Chakravarti 1936:229; Fabri 1934:51-6,1936:230:PI. CXIX a). Although there was much pros and con about the hypothesis that these pictures represent a "Proto Indus Scrip", there seems to have been no further attempt to discover more rockpictures of this kind in Orissa.

Only in 1969/70 other rock art sites were found in the Hemgiri Reserve Forest of the Sundargarh District (IAR 1969/70:61).

Dinanath Pathy, in his 1974 Written M.A. Thesis on painting in Orissa, mentioned several of the then known rock picture sites in this state. In a later publication (Pathy 1984:11-15) he also mentioned several other sites which he had visited during field-trips. Pathy published several photographs and drawings of these pictures as well.

I myself was guided by a schoolteacher from Lefripara to the Osakothi Shelter during an exploration trip in 1976.

In 1987 I visited again several rock art sites in the Sambalpur and Sundargarh Districts. The rock art sites around Chenga Pahar were then documented for the first time[1].

Although the discussion about the pictures in the Vikramkhole shelter reached a larger scientific audience, based on no more than speculation it vanished without creating any long lived interest in the rock art of Orissa. Today rock art from Orissa is generally unknown even amongst archaeologists and prehistorians. This is the more surprising, since the rock engravings from the Vikamkhole shelter were cast into plaster-of-paris and exhibited for several years in the State Archaeological Museum in Bhubaneshwar.

One reason for the scarce interest in these pictures seems to have been the absence of a narrative pictorial code of expression which is so pronounced in the rock art of Central India. It seems that the rock pictures in the Sambalpur and Sundargarh Districts have nothing in common what so ever with the prehistoric pictures of Central India. These pictures seem to belong to a pictorial tradition largely unknown and unrecorded yet.

Comparison of the rock pictures from the limited area of the Sundargarah and Sambalpur Districts is hampered on account of the small number of pictures found so far. Too many of the features are unique[2]

All the sites in this area were found several kilometres apart from habitaion sites in stretches of dense forests.

The geological situation in which these shelters are found is comparable to all the other Central Indian rock art sites found in quartzite-regions. The shelters are naturally formed cavities mostly found at the base of horizontally deposited sandstone formations, forming sometimes extensive plateaus, which are fringed by cliff like escarpments. These escarpments are eroded and deeply scarred by water courses. These sandstone shelfs are at places broken and dissected by tectonic faults which as well were broadened by watercourses to cayon like gorges. The painted shelters are situated at the fringes of these plateaus or at the walls of the gorges. Most of them are at some elevation, facilitating a wide view over the surrounding landscape, still a few are situated in deep canyons, which are rather hidden.

The sandstone in this area is rather large grained and not very homogenous. The differnt layers of the stone show an irregular density, pigmentation and size of grains. The pigmentation runs from grey to reddish-brown, rather reminiscent of the structure and pigmentation of the sandstone in the Mahadeo Hills.

Although there exists a large number of cavities and shelters in this geological formation, still only a small fraction of these has paintings. The openings of the painted shelters do not show a preference towards a particular direction.

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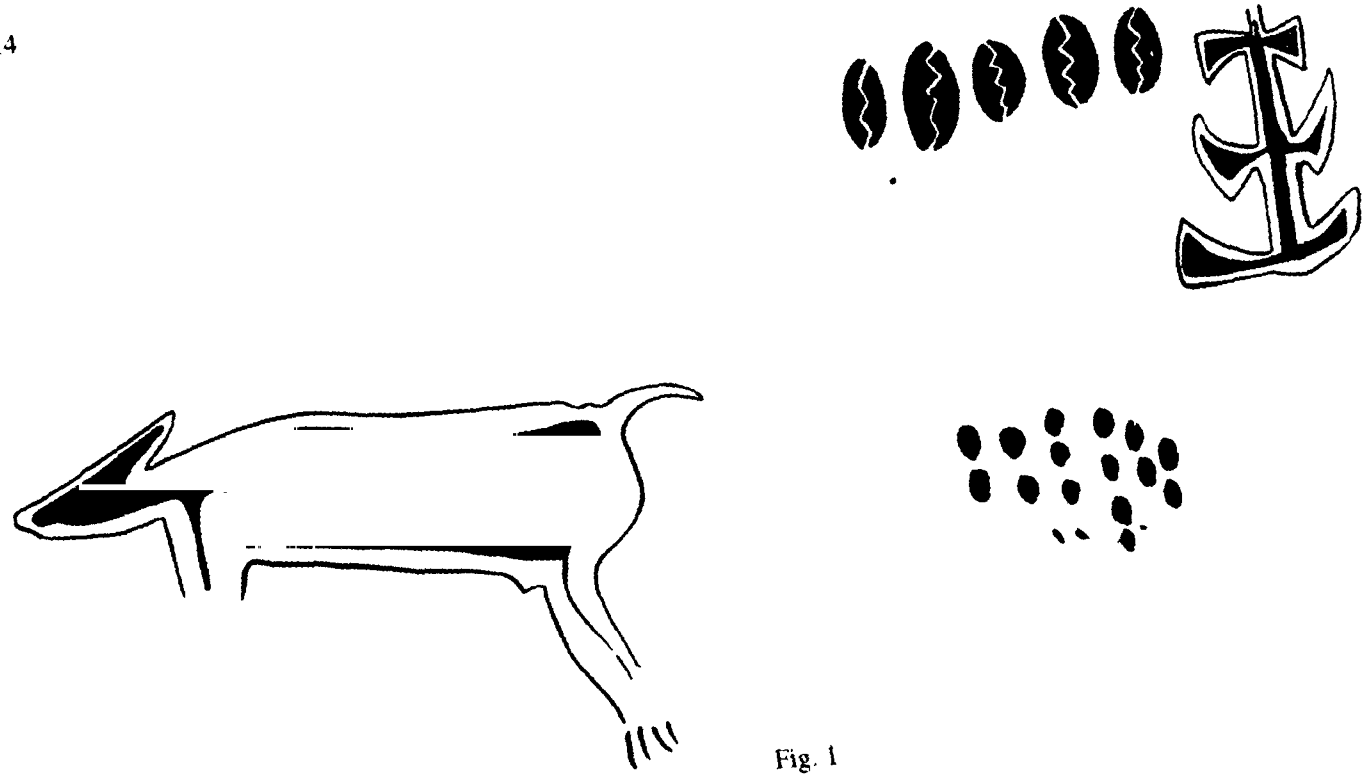


Fig. 1

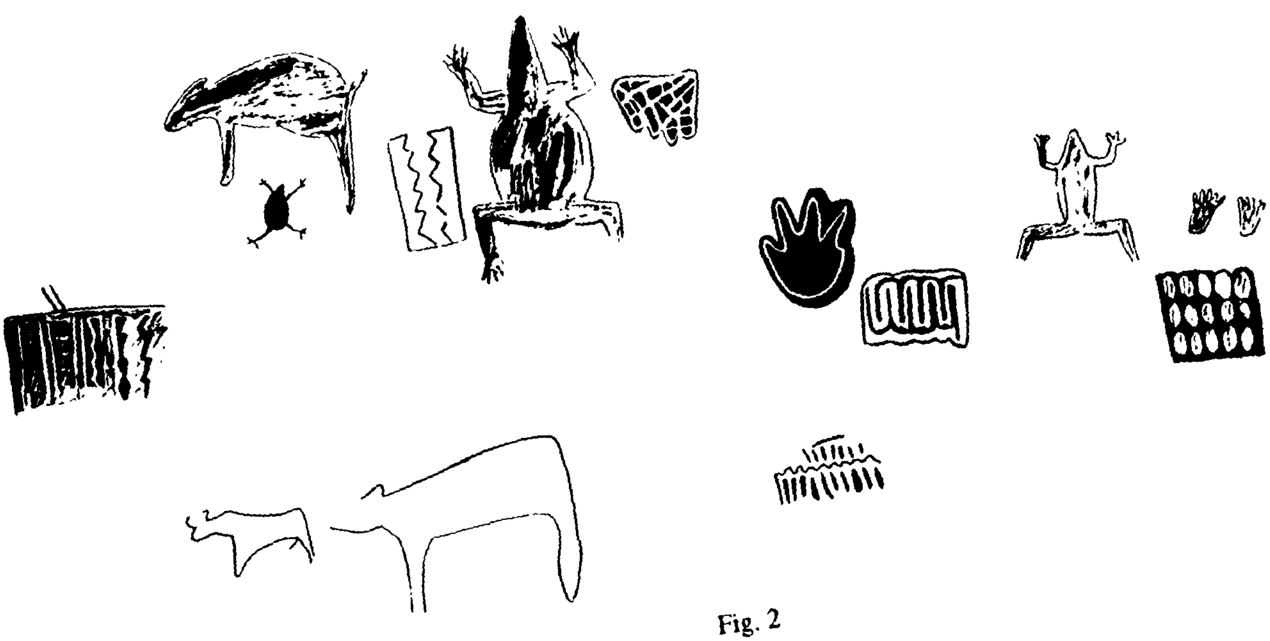


Fig. 2

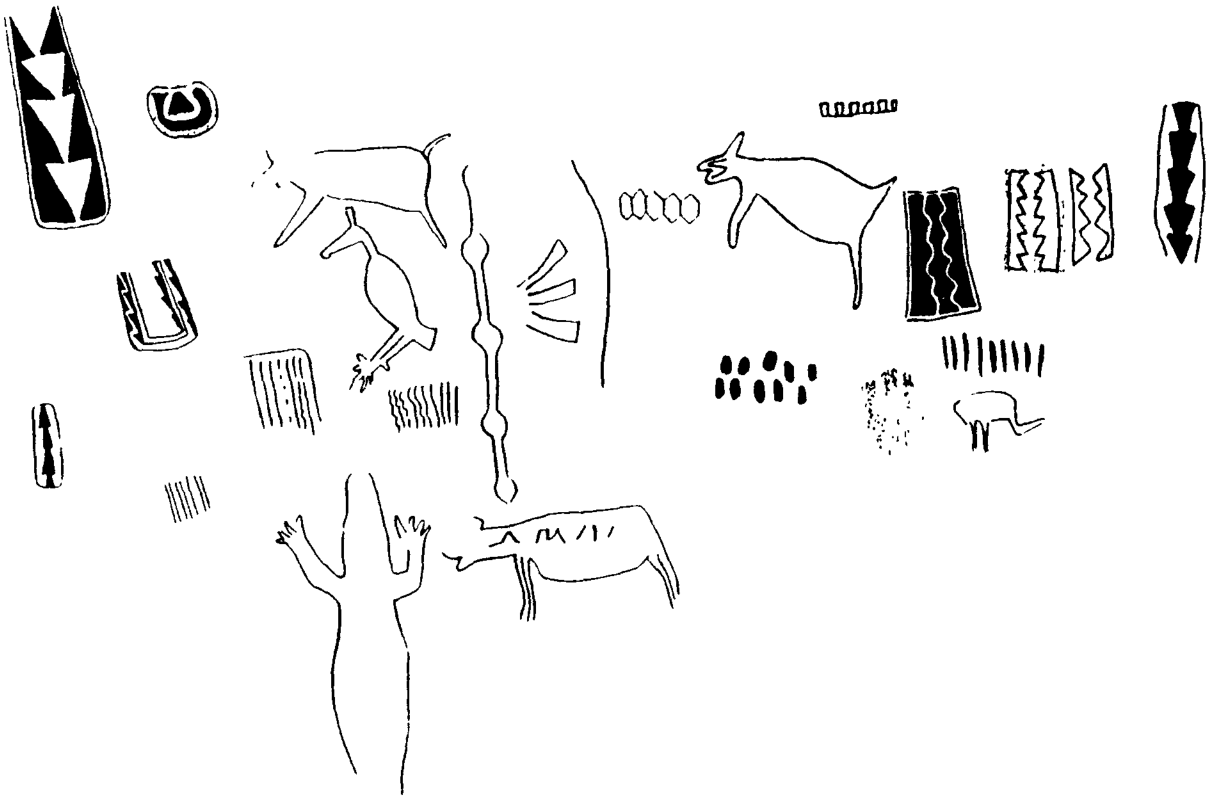


Fig. 3

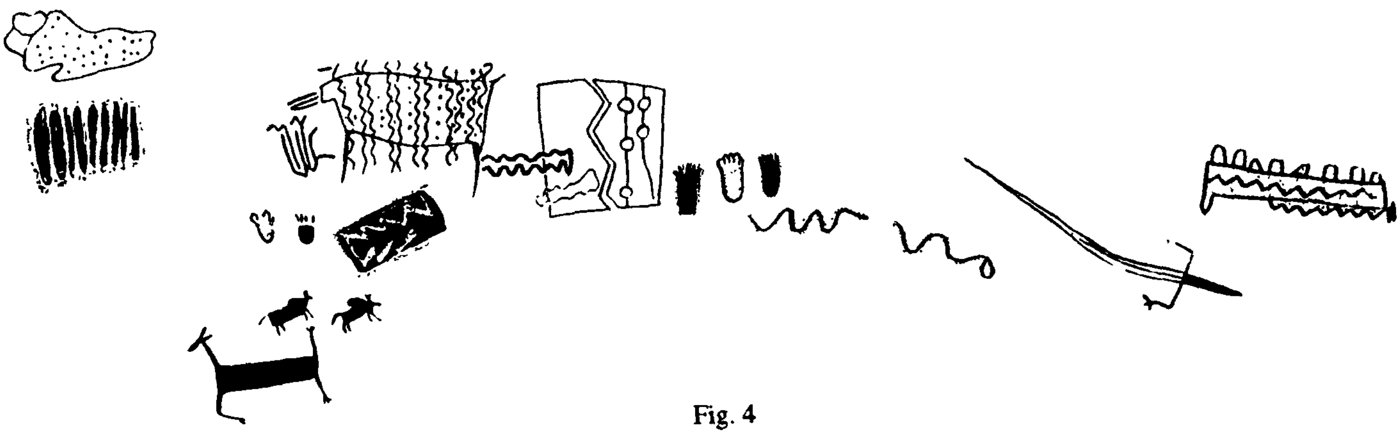


Fig. 4

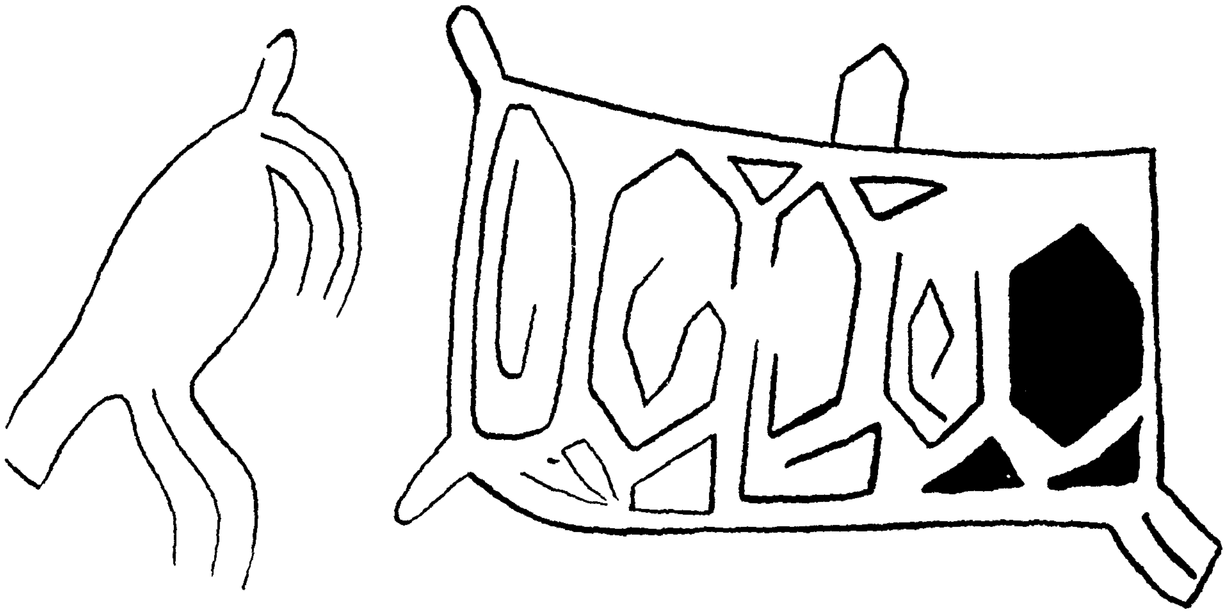


Fig. 5

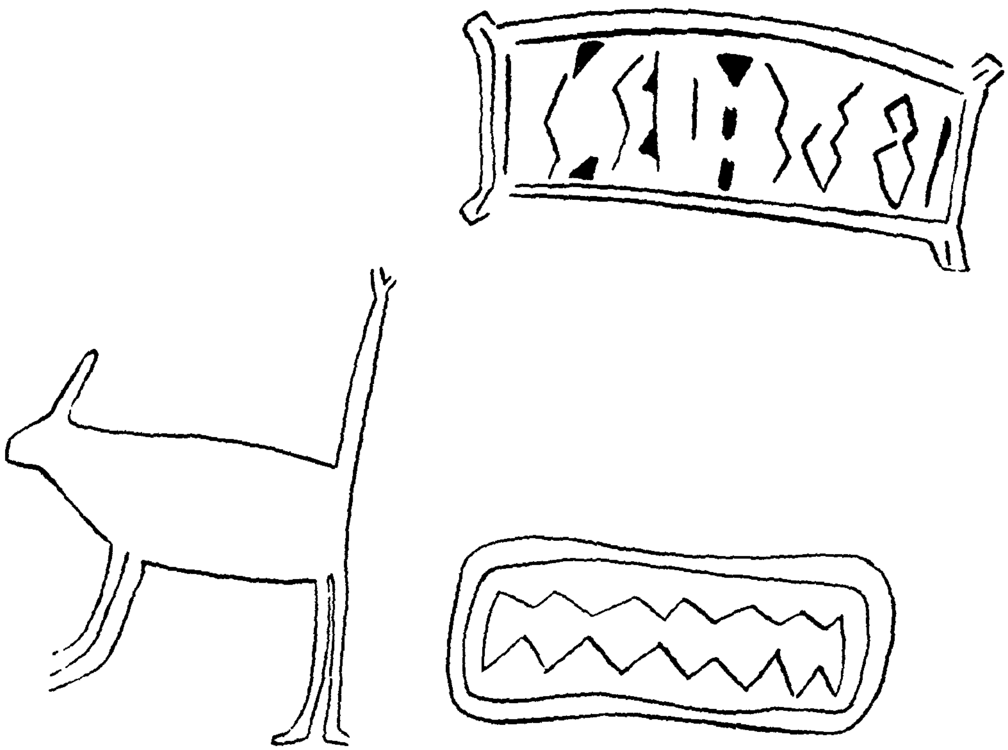


Fig. 6

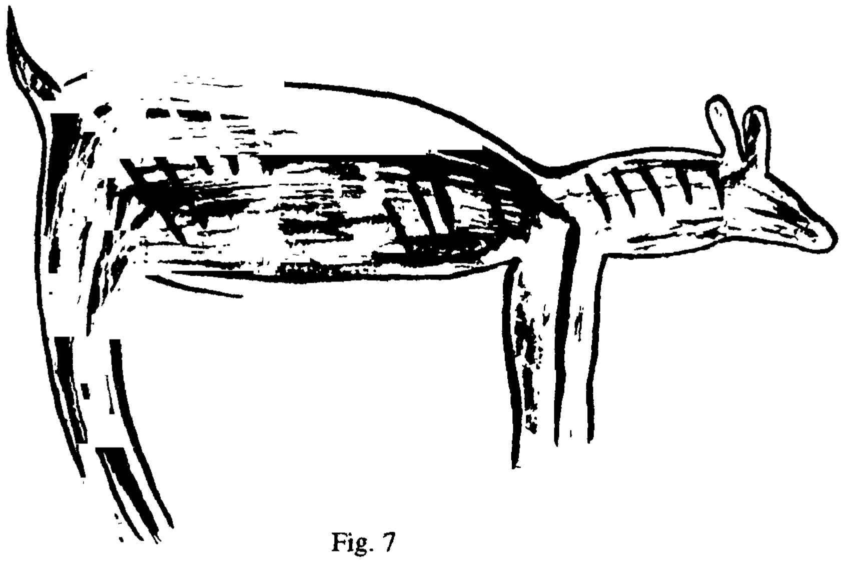


Fig. 7

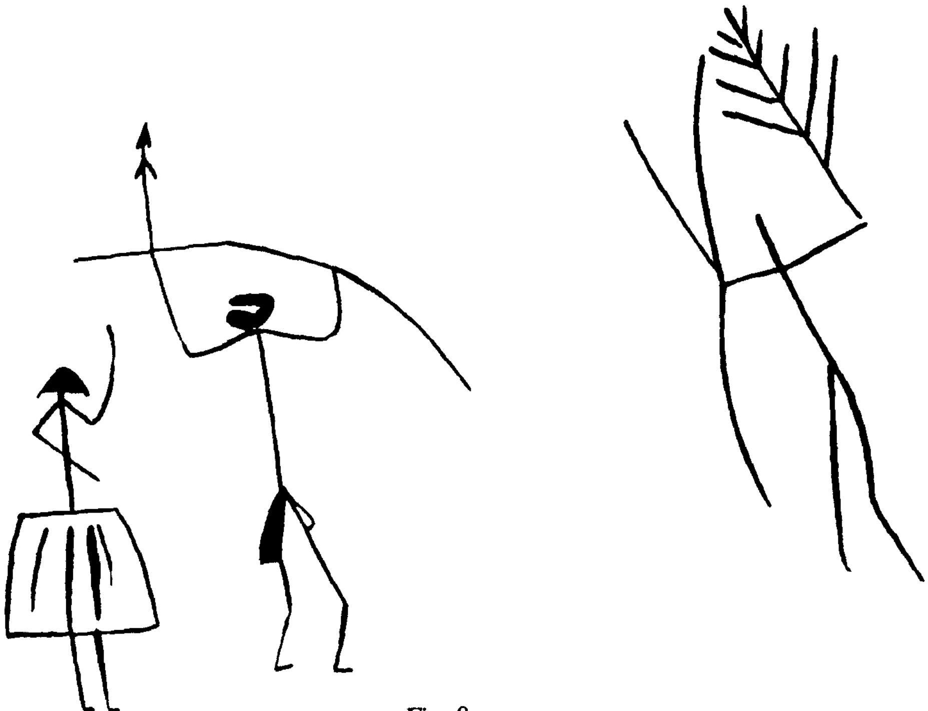


Fig. 8

Paintings as well as engravings are to be found at places well protected against rain and humidity, but most of the pictures are exposed to direct sunlight.

Paintings and engravings are often fashioned at extremely soft rock surfaces, which are vulnerable to exfoliation and erosion. In Osakothi a layer of rock soft to be abrased by wood was chosen for the application of engravings. These soft and scaling rock walls are even more vulnerable to the growth of lichens and fungus. The exfoliation is facilitated by insects which build nests and cocoons in pores and small breaks of the rocksurfaces. This extern material forms a nucleus of organic material which swells and shrinks with fluctuating humidity, and speeds up the exfoliation process.

Paintings as well as engravings are at times sealed by different kinds of more or less opaque patina. Although these patina obstruct the visibility of pictures, it also protects the surface and pictures from external erosion. The vegetation in front of the shelters form a potent windbreak and also a good filter against dust. Vegetation in front of the shelter also can reduce the fluctuation of temperature in the interior of the cavity, and at the same time reduce the fluctuation of the relative humidity as well, which will slow down the exfoliation of the rock-surface.

As at most other rock art sites in India, there are pictures of different styles as well as of different making and ages at rock art sites in Orissa placed one above the other at the same walls.

Still by far the most prominent pictures at the rock art sites in the Sundargarh and Sambalpur districts are polychrome paintings of red and accompanying white lines. The use of black colour is comparatively common, considering the fact that black is almost never used in the rock art of Central India. Beige and yellow was used but rarely. All the pigments seem to have been applied in pastouse condition

Engravings are common in the rock pictures of this style. The figures are bruised deeply into the stonesurface, the grooves and polished areas are frequently filled in with colour pigments. Rarely do these engravings show "naturalistic" forms, and if they do it will be most often the silhouette of an animal. But more often it will be some "abstract form" like triangles or lattice like intersecting lines. These engravings are frequently filled in with pigments and/or accompanied by a colour of contrast. Quite often the engraved figures are enlarged by pigment drawings.

Engravings of human hands are frequent at the site Ulapgarh, but anthropomorphous figures are totally absent.

In Osakothi and Ulapgarh large rock-spaces are "decorated" with stencilled "broom-designs". These pictures of radiating rods are aenerally 20 to 50 cm in length The individual rods are depicted in clear and lines, which makes me believe that these "brooms" are fashioned by striking bundles of colour dipped rods on to the walls. But that each of these "brooms" is different might speak against this explanation.

The species of the rarely depicted animal figures in these pictures are never really to recognize. Horns or antlers are not depicted nor are other specific body features understandable.

Only single depicition of a bird is known to me This unique picture is found in Lakhamara (Fig. 3), Lizards known from several painting sites (Figs. 3-4).

The earliest pictures mainly show "abstract" figures which are prominently placed over the rock walls The aesthetic of these pictures is obviously very different from the early rock art in Central India. Still there are several details of design patterns which are comparable to features in the mesolithic art in the paintings of Central India. The most eye-striking stylistic parallel are the intricate rhombic and spiral patterns, which are fillings of some of the "geometric" figures (Figs. 5, 12). These spiral and honeycomb patterns are a stylistic "Leitmotif" in the earliest rock art of India

No further chronological indicatioins are available in the earliest rock pictures of Orissa. The depicted animals are too schematic to understand them as domestic or non-domestic. And within all the pictures is not a single figure of a tool or weapon which would indicate the technological status of their creators.

Only a single picture group-three diminutive humans-can be compared with the mesolithic rock art of Central India (Fig.8). This picture is situated close to the bridge rock of Chhenga Pahar. One of these three stick figures is holding bow and arrow. The arrow is shown with barbs at the tip, so typically of the mesolithic rock art of Central India. But since this picture group is stylistically unique, locally isolated and in no stratigraphic relation to the other pictures, it is difficult to Place it chronologically.

It should be mentioned, that the well known rock pictures of Singhanpur are only a few kilometres apart, and it is more than surprising that there are not more analogies between the pictures from Singhanpur (Ghosh 1932) and the early rock pictures in the Sundargarh and Sambalpur Districts of Orissa.

It is difficult to understand that there should exist a stylistically unique rock art tradition in a region which is geographically not distinct nor far apart from the Central Indian rock art sites. The only stylistic analogies-- the intricate rhombic designs--do form, indications of a relation with the mesolithic art of Central India. The rather heavy

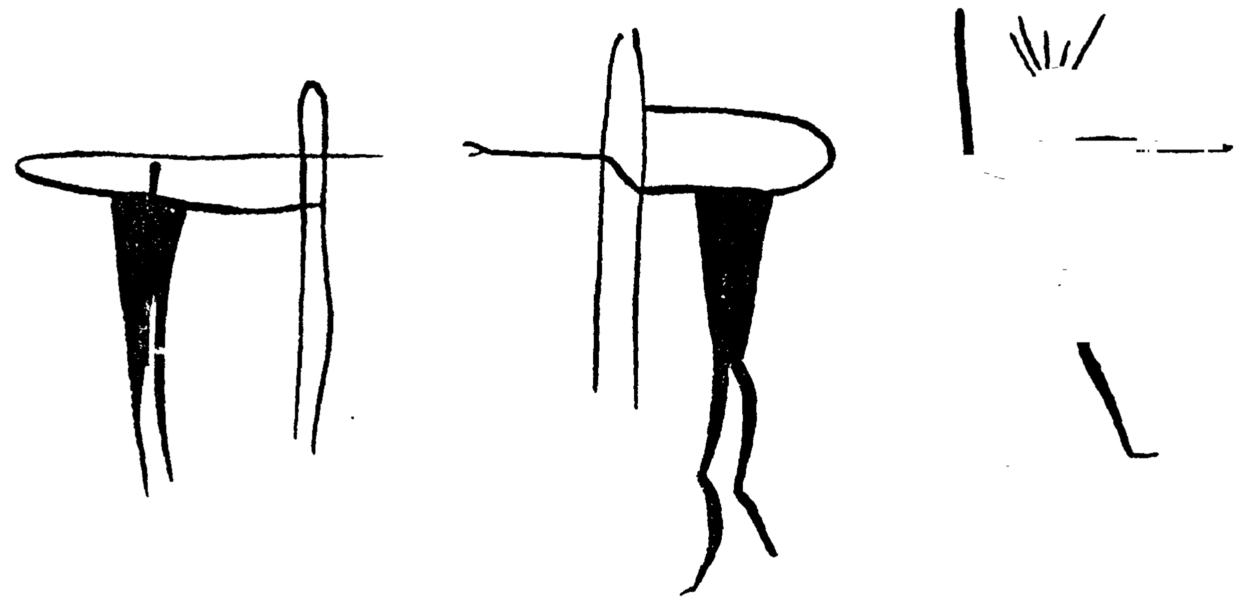


Fig. 9

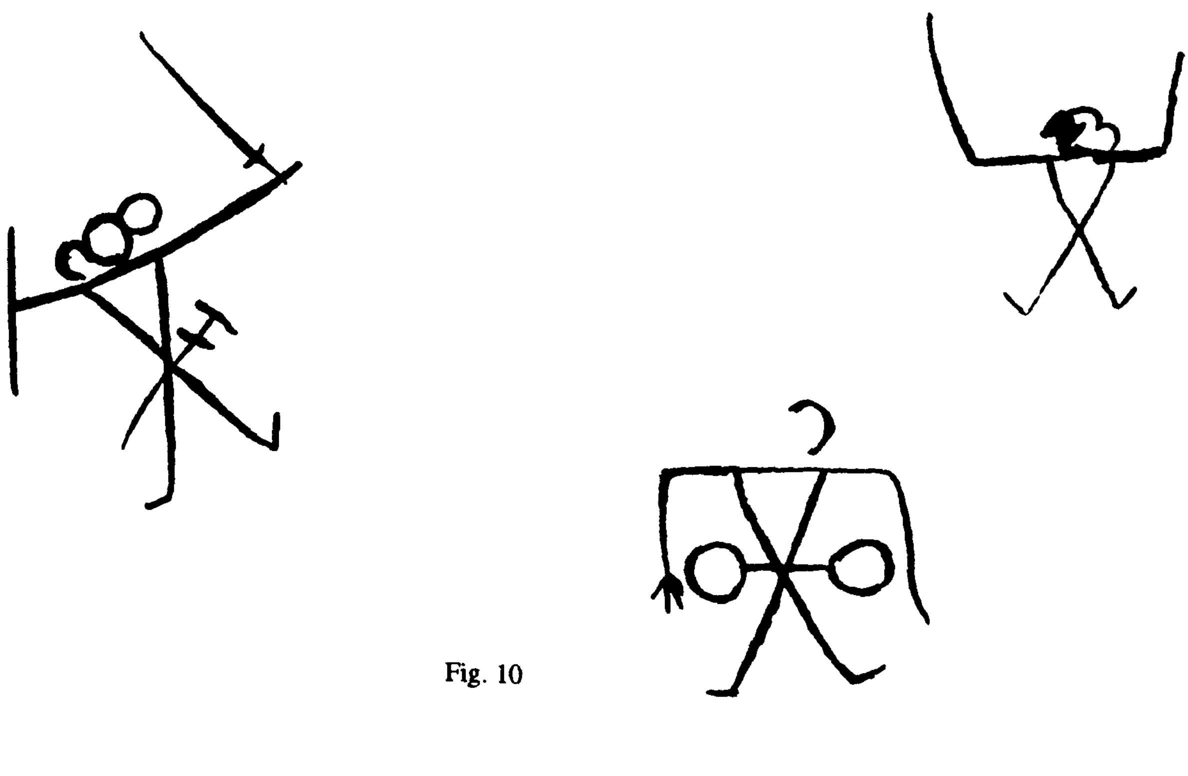


Fig. 10

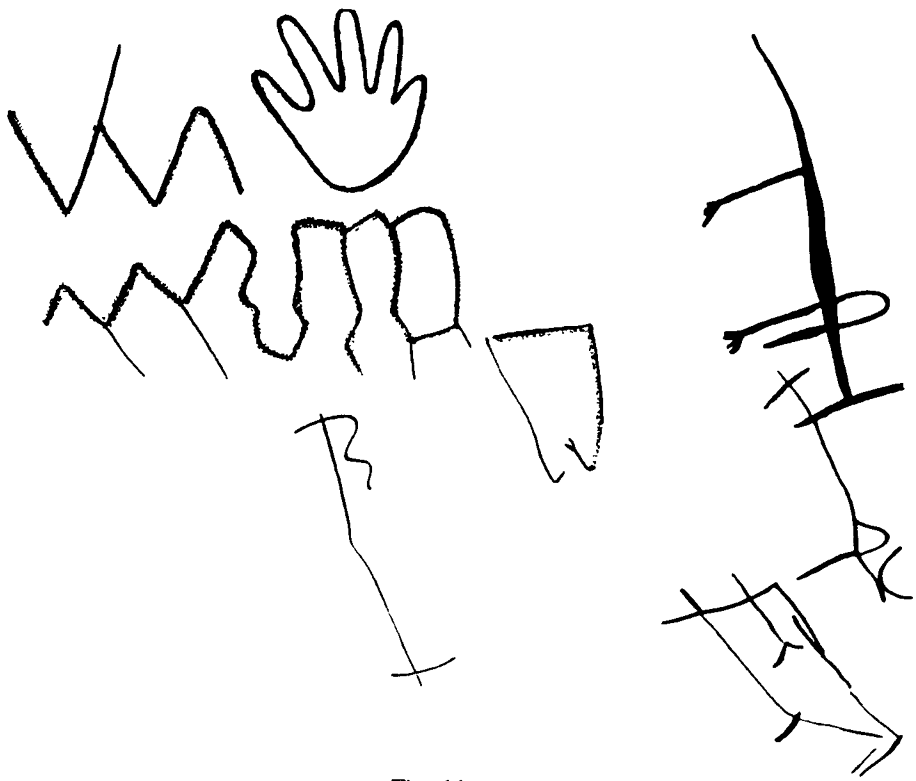


Fig. 11

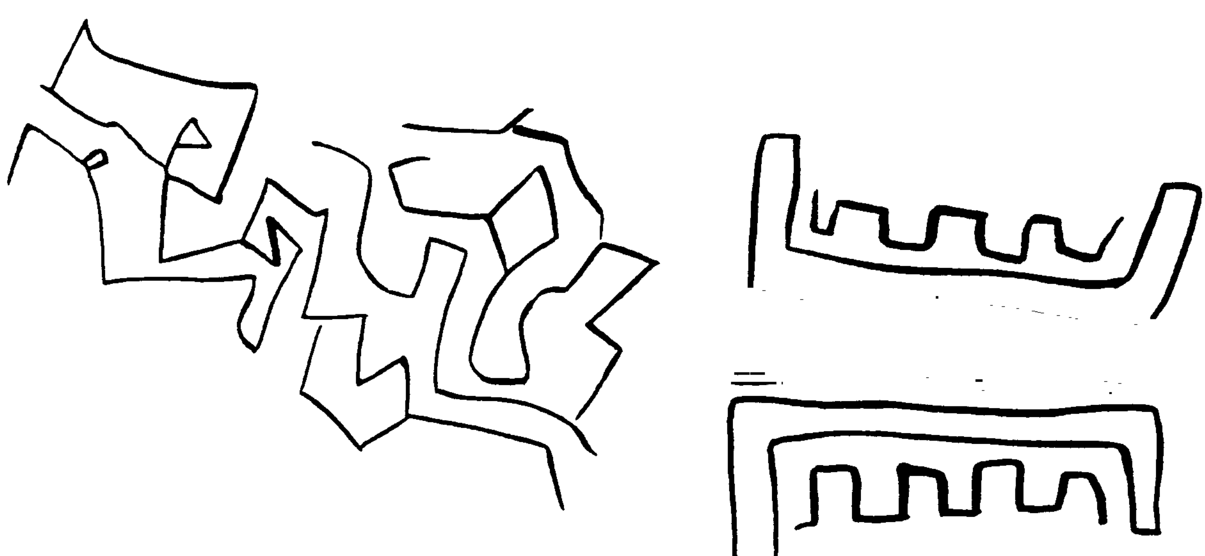


Fig. 12

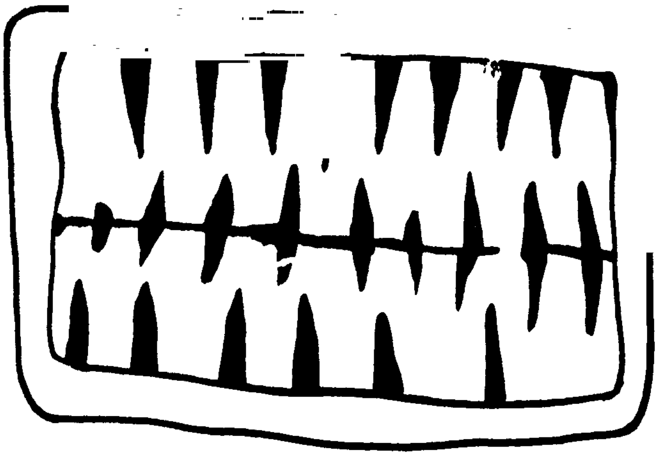


Fig. 13

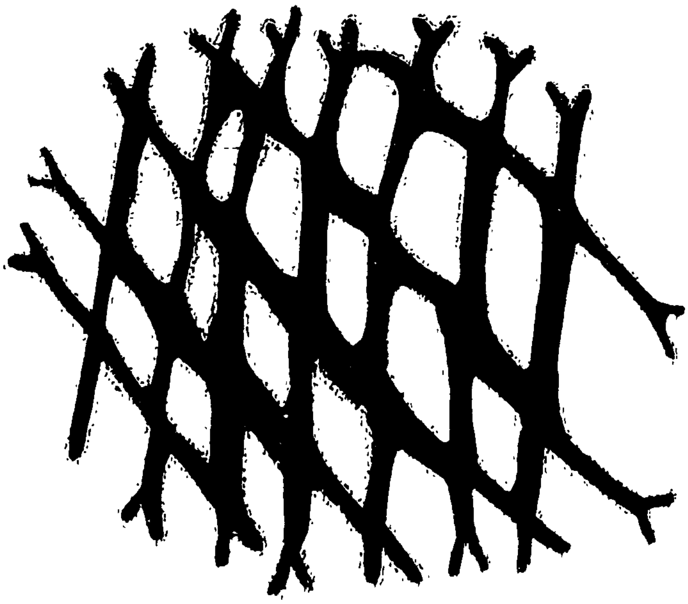


Fig. 14

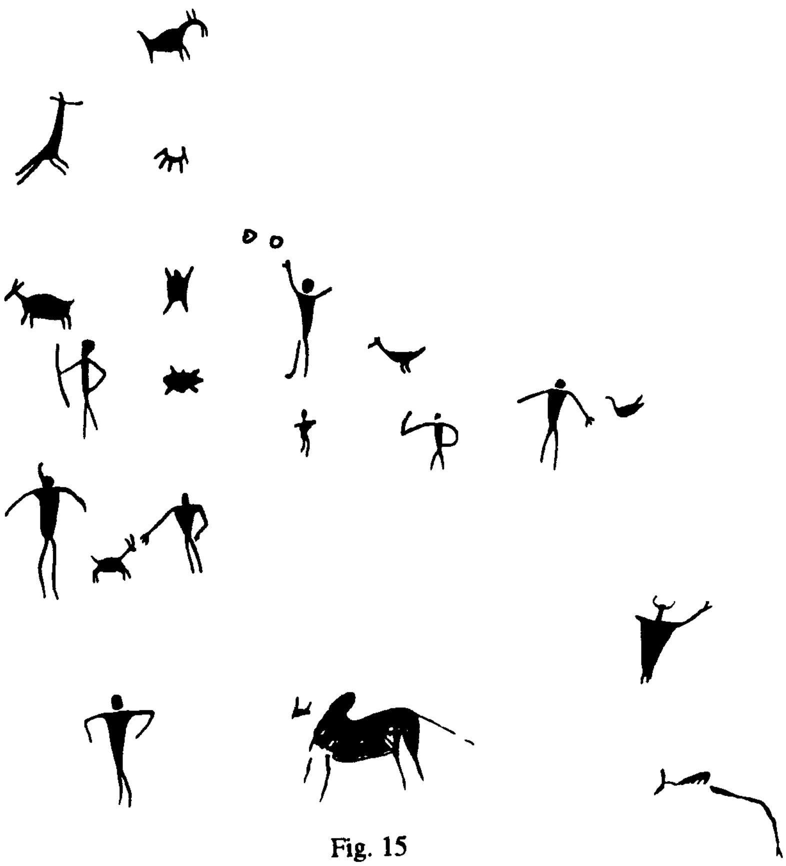


Fig. 15

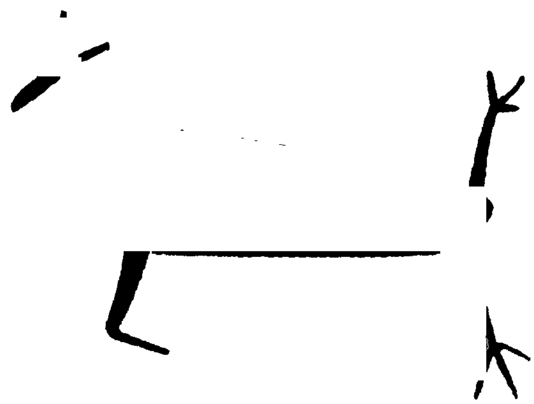


Fig. 16

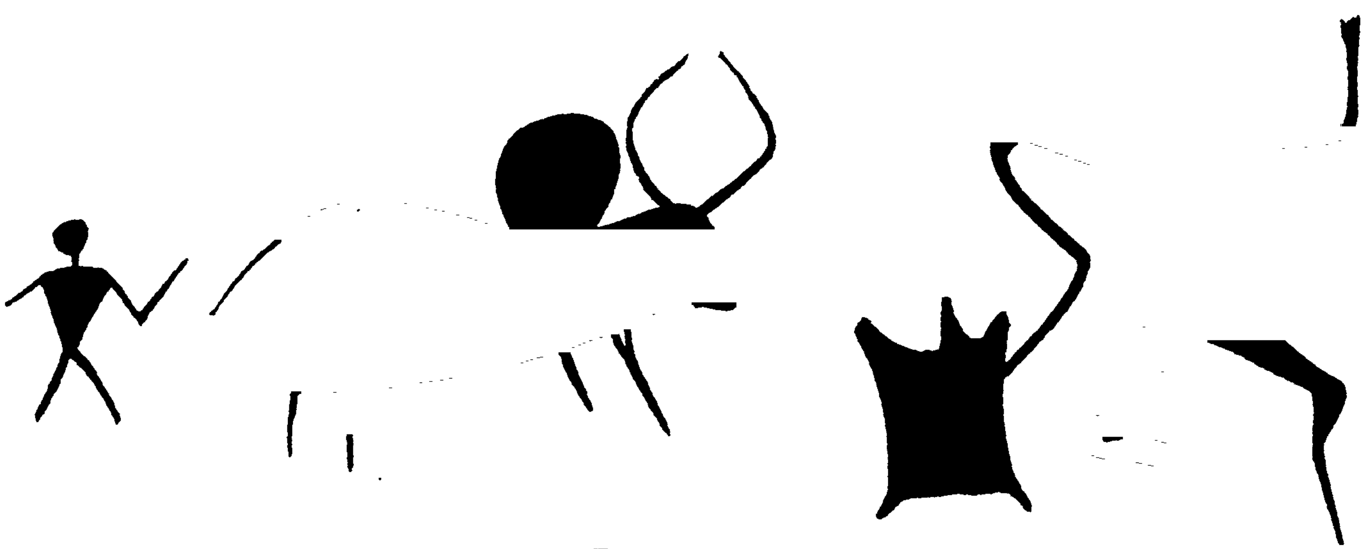


Fig. 17

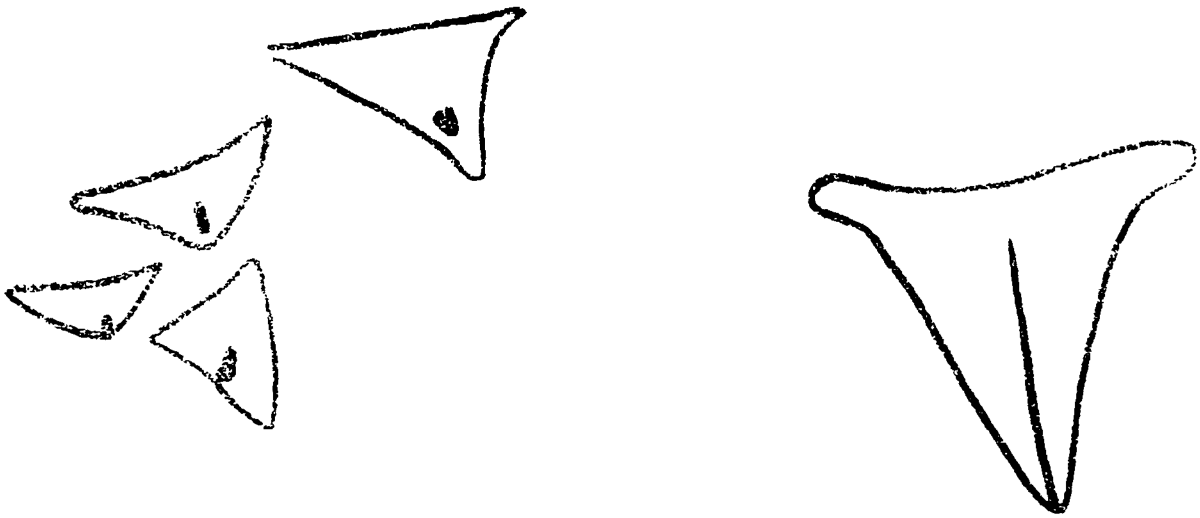


Fig. 18

with the mesolithic art of Central India. The rather heavy handed and placative depictions of animals are comparable with the depictions of animals in the later pictures of the mesolithic hunters and gatherers of the southern Deccan (Neumayer 1989).

Engraved pictures filled in with pigment are known from the rock art site Bainete Banda in the Kammam District of Andhra Pradesh. The pictures there are mostly engravings of animal footprints and a few animal figures which are too schematic to recognize the species of the depicted animals. Besides these zoomorph depictions there are also "abstract figures" grouped together in unknown relations. Several figures of stick man and figures of lizards or crocodiles seem to belong to the same style group. Later pictures in Bainete Banda show paintings of trees hung with honeycombs, and even later are paintings of historic subjects like humped bulls and cattle.

Although there are superficial stylistic analogies between the later pictures of the hunters and gatherers of the Southern Deccan and the earliest pictures in the Sambalpur and Sundargarh Districs, the pictures in Orissa surely belong to a basically different pictorial tradition which might had its centre in the eastern parts of India, a region which is not well explored for rock art yet.

At the rock picture sites in the Sambalpur and Sundargarh Districts are also a number of paintings which obviously belong to the historic period. Most of these pictures were found in the vicoinity of Chhenga Pahar (Figs. 5,15,16,17,18) and show the usual themes of these pictures like humped cattle armed human persons with oversized head decorations etc... Besides cattle there are also figures of goats (Fig. 15), birds and turtles (?) besides heart shaped and circular symbols (Fig. 15). Although these pictures are stylistically and thematically comparable with historic rock pictures from Central India, there is no further indication about their chronological affinities. These pictures do not contain figures of weapons or other technological innovations which would indicate the period in which these pictures were done.

Of the same general period are white pictures of warriors. which are invariably drawn with a triangular body. They are armed with swords, and a few of them carry double-drums. These pictures overlay engravings of triangles, of which several are placed over natural holes, so that these figures create very much the impression of female organs, particularly since several of these are painted red (Fig. 18) The holes in the rock - although natural - are artificially enlarged and serve as beehives for the small rock-bee.

During our visit several of these holes were populated by bees, and in several of the empty holes wooden spatles were deposited.

The locations of the sites mentioned

During the explorations in 1988 eight art sites were visited and documented.

The Sites in the Sundargarh District:

Site Name	Topo sheet No	Square	Horizont./Vertic.
Osakothi	64N/12	B1	150/94 mm
Phuldungri	64N/12	C2	82/10 mm
Brahmanigupha	64N/12	C2	117/8 mm
Chhenga Pahar			
Bridge Rock	64N/12	C2	148/20 mm
Lakhamara	64N/12	C2	164/26 mm
Sargikhol	"	"	" "
Chhichiriakhol	64N/12	C2	171/30 mm

Manikmada (Pathy,D , 1984:11-5) this site could not be found during my visit.

The Sites in the Sambalpur District:

Ulapgarh	64 0/13	B2	7/17 mm
Vikramkhol (was not visited during this journey)			
Titliabahal			
(Teteliabahal)	64 0/13	A2	45/170 mm

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1. The exploration team consisted of Christine Schelberger, Manoj Kumar Sahu and the author. The field trip took place in February 1988.
2. After our visit to the rock art sites in Orissa, engravings were reported at a site near the Sideshwar Temple in the Cuttak District (The Hindustan Times 1988.4.26:7).

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The Harappans In Saurashtra: New Chronological Considerations

GREGORY L. POSSEHL

One of the time honoured facts of Indian archaeology is that the Chalcolithic sites of Saurashtra are properly classed as "Late Harappan." This implies that they should be dated to the period following the decline of the Indus cities in Sindh and the Punjab. Recent archaeoloical research in Gujarat has produced a series of interesting and important radiocarbon dates that have brought this into question. A short history of work in Gujarat will provide a background leading up to the new data.

Rangpur

M.S. Vats is credited with the first excavation of a Harappan site in Gujarat. It took place at Rangpur in 1934-35 at the invitation of the erstwhile Thakur sahib of Limbdi State. Vats excavated three trenches in this huge, sprawling mound which is much affected by lateral stratigraphy. He found almost no architecture but a great deal of pottery, which he classed with the Indus black and red ware. Vats noted that the presence of triangular terracotta cakes and perforated vessels reinforced this position. Some of the ceramics seemed to be more evolved than those of the Early and Intermediate periods of Mohenjo-daro or Harappa and Vats concluded, "Provisionally it may be taken to correspond with the Late Period of the Indus Valley sites or perhaps intercalcated between that and the date of the Cemetery H at Harappa" (Vats 1934-35: 38). It is with this cautious, appropriate, and above all, preliminary assessment of Rangpur that the myth of the "late Harappans of Gujarat" began.

It is not faulting Vats to note that he conducted no detailed analysis of the Rangpur material, nor was there any systematic way for him to give certain date to these remains. His was a simple observation, that Vats must have thought would be either confirmed or denied by more systematic work at the site.

In 1936 G.S. Ghurye returned to excavate Rangpur and neighbouring Vallabhipur (Ghurye 1939). His assessment of the site was also preliminary and in agreement with the Vats determination.

M.G. Dikshit excavated at Rangpur in 1949 (Dikshit 1950). He felt that the pottery of the site was quite different from Harappan wares and that it represented the post-Harappan Period (Dikshit 1950). This was, once again, a somewhat casual judgment, not arrived at as a result of detailed study or with the assistance of systematic dating methods.

The most concentrated work at Rangpur took place during three seasons, beginning in 1953-54, under S.R. Rao of the Archaaeological survey of India. While Rao's chronology admitted a phase of occupation equivalent to the Urban Phase Harappan (ca. 2550-2000 B.C.), he concluded that most of the sequence (Rangpur IIB/C and III) was "Late Harappan."

The data may not be at hand to critique the dating of the Rangpur sequence but it should be emphasized that beginning with Vats's observation, everyone who has worked at Rangpur has concluded that the site is basically "Late Harappan" even in the absence of firm data to back this up. There are still no radiocarbon dates from Rangpur.

The University Museum, University of Pennsylvania, Philadelphia, PA 19104 - 6324.

As the archaeological exploration of Gujarat proceeded masses of Chalacolithic sites were found by the Archaeological Survey of India, the Gujarat State Department of Archaeology and other workers. The author's Gazetteer of archaeological sites in Gujarat now lists 542 sites that are in some way affiliated with the Indus Civilization, including those in North and South Gujarat, as well as Kutch. While those who work with this data realize that there has been some double counting (e.g. the same site reported by two names) the number of Protohistoric sites in the region is impressive.

Using the similarities of the ceramics of these sites and relating them to Rangpur (for many years the only stratigraphic sequence available), a comparative stratigraphy for Saurashtra was constructed by archaeologists. It was quite apparent that the vast majority of the sites in this region had pottery that was similar to Rangpur IIB and IIC, with some Lustrous Red Ware of Rangpur III. The "Late Harappan" of Saurashtra was seen as a period of dense settlement in the region, with some decline in the number of sites during Lustrous Red Ware times.

This interpretation could be called the " standard sequence" for the region. More than one researcher has accepted (fallen prey to?) this scheme, even though there was no systematically secured date for either Rangpur IIB or IIC (Possehl 1980; Allchin and Allchin 1982: 243-44; Sankalia 1974: 379-83).

There seems to be a consensus among those who have dealt in detail with this data that there appears to have been an error. Everyone realizes that what was done in the past was an undesirable manner in which to proceed, but was there choice? Everyone wanted new excavations to produce evidence in the form of artifacts and radiocarbon dates that would either confirm or deny the scheme.

The renewed excavations at Rojdi, begun in 1982-83 by a team from the Gujarat State Department of Archaeology and The University Museum of the University of Pennsylvania, offered such an opportunity. A part of the research programme at this site was the systematic collection of carbon samples to carry out the test of the preliminary Rangpur chronology that had been in use to this time. In addition excavations at Kuntisi and Babar Kot provided more opportunities to acquire carbon samples to check Vats's preliminary statement.

New Radiocarbon Dates

A report on the Rojdi excavations has been published (Possehl and Raval 1989). The excations confirmed the fact that the site has three major phases of occupation: Rojdi A, B and C. There is no Lustrous red Ware there and the ceramics are all strikingly similar to the Rangpur material assigned to Periods IIB and IIC. Sixteen radiocarbon dates from Rojdi are given in Table 1.

Table 1

Radiocarbon Dates From Rojdi

Site/Lab No.	5568 Half-life B.P.	5730 Half-life B.C.	Calibration 2.
Rojdi A			
PRL-1091	4150 ± 110 B.P.	2325 ± 115 B.C.	2867,2808,2772,2723, 2699 cal. B.C.
PRL-1085	4020 ± 110 B.P.	2190 ± 115 B.C.	2573, 2535, 2506 cal. B.C.
PRL-1087	4010 ± 110. B.P.	2180 ± 115 B.C.	2569, 2538, 2503 cal. B.C.
PRL-1283	3980 ± 100 B.P.	2140 ± 105 B.C.	2554, 2548, 2491 cal. B.C.
PRL-1093	3920 ± 110 B.P.	2090 ± 115 B.C.	2462 cal. B.C.
PRL-1089	3870 ± 120 B.P.	2035 ± 125 B.C.	2451, 2433, 2392, 2384, 2356 cal. B.C.
PRL-1284	3810 ± 100 B.P.	1980 ± 105 B.C.	2283 cal. B.C.
PRL- 1285	3740 ± 140 B.P.	1900 ± 145 B.C.	2181, 2166, 2142 cal. B.C.
Rojdi B			
PRL-1083	3875 ± 125 B.P.	2040 ± 130 B.C.	2452, 2427, 2395, 2374, 2366 cal. B.C.
TF-200	3810 ± 110 B.P.	1975 ± 115 B.C.	2283 cal. B.C.
PRL-1088	3770 ± 120 B.P.	1935 ± 125 B.C.	2198, 2151, 2149 cal. B.C.
TF-199	3590 ± 100 B.P.	1750 ± 105 B.C.	1947 cal. B.C.

Site/Lab No.	5568 Half-life B.P.	5730 Half-life B.C.	Calibration 2.
Rojdi A			
PRL-1281	3520 ± 110 B.P.	1680 ± 115 B.C.	1883 cal B.C.
PRL-1282	3470 ± 140 B.P.	1620 ± 145 B.C.	1866, 1846, 1772 cal. B.C.
Rojdi C			
PRL-1084	3700 ± 145 B.P.	1860 ± 150 B.C.	2133, 2067, 2047 cal. B.C.
PRL-1081	2360 ± 210 B.P.	4800 ± 15 B.C.	402 cal. B.C.

As these dates were being processed and reported it became increasingly clear that the bulk of the occupation of Rojdi took place during the second half of the third millennium B.C. not the early second millennium, as the chronology proposed for Rangpur suggested. This was noted in the report on the work there (Possehl and Raval 1989: 12-13). As interesting as these radiocarbon determinations from Rojdi proved to be, there was some reluctance to revise the "standard" scheme for the chronology of protohistoric Gujarat. After all, there was still only a handful of dates and they all came from just site- 3. This has now been done, to degree, and the results from four additional sites (Babar Kot, Kuntasi, Nagwada and Prabhas Patan) are presented in Table 2.

Table 2

Additional Radiocarbon Dates from Gujarat

Site/Lab No.	5568 Half-life B.P.	5730 Half-life B.C.	Calibration
Babar Kot Stratum 3			
WIS-2232	3900±105 B.P	2065±110 B.C.	2457 cal. B.C.
Babar Kot Stratum 4			
BETA-43245	3660±70 B.P.	1820±70 B.C.	2037 cal. B.C.
BETA-43246	3700±60 B.P.	1860±60 B.C.	2133, 2067, 2045 cal. B.C.
WIS-2235	3730±60 B.P.	1890±60 B.C.	2140 cal. B.C
WIS-2234	3775±120 B.P.	1940±125 B.C.	2200 cal. B.C.
PRL-1492	4030±120 B.P.	2200±125 B.C.	2576,2531, 2510 cal. B.C.
Babar Kot Stratum 6			
PRL-1487	3850±110 B.P.	2015±115 B.C.	2334 cal. B.C.
Kuntasi			
PRL-1370	3710±160 B.P.	1870±165 B.C.	2135, 20552, 2050 cal B.C
PRL-1371	3650±140 B.P.	1810±145 B.C.	2034 cal. B.C
Nagwada			
A-4555	3700±80 B.P.	1860±80 B.C.	2133, 2067,2047 cal. B.C.
Prabhas Patan, Period II, The Prabhas Period			
PRL-92	3830±95 B.P.	1995±100 B.C.	2299 cal. B.C
TF-1286	3595±90 B.P.	1755±95 B.C.	1953 cal. B.C.
TF-1284	3465±95 B.P.	1620±100 B.C.	1859, 1848, 1769 cal.B.C.

Babar Kot (22 16'30" N-71 34'00" E) is located on the Goma Nadi in Paliyad Village, Botad Taluka of far northern Bhavnagar district in Saurashtra. The site was discovered by S.R. Rao in 1955-56 (IAR 1955-56: 70; Rao 1963. 184-85, 206). It is a Sorath Harappan site, as defined by Possehl and Herman (1990) and was exacavated in 1990-91 by the same team that undertook the rejuvenated excavation at Rojdi

Kuntasi is the sorath Harappan site excavated by the Gujarat State Department of Archaeology and Deccan college. It is located in northern Rajkot District, near the Gulf of Kutch.

Nagwada is the Harappan site in the Rupen estuary of north Gujarat that has been excavated by the M.S. University of Baroda (Hegde et al. 1988).

Prabhas Patan, or somnath is a well-known site on the southern coast of Saurashtra (Nanavati, Mehta and Choudhary 1971).

The Late Harppan Period: The Need for a Revision

There are now five sites affiliated with the Harappan Civilization that have radiocarbon dates relating to the revision of the Rangpur sequence, proposed as a result of the re-excavation of Rojdi. The dates presented in Tables 1 and 2 are striking in that they clearly show by way of radiocarbon dates that most of these sites were not occupied in the second millennium, but during the second half of the third millennium (2500-2000 B.C.). This is contemporary with the Urban or Mature Phase of the Indus Civilization in Sindh and the Punjab. These sites are not "Late Harappan" but "Mature Harappan," at least in date.

There are some dates that fall in the second millennium B.C. and this would be a "Late Harappan" time period. In fact this was recognized at Rojdi, where Period C was placed at 2000-1700 B.C. (Possehl and Raval 1989: 171). the Prabhas Period II at Prabhas Patan might well fit in that category as well. It is equally clear that the vast majority of the Sorath Harappan sites in Gujarat do not.

What Of Lothal ?

The excacation at Lothal did not play nearly the role in formulating the "standard" chronology for Saurashtra as did Rangpur, in spite of the fact that there were radiocarbon dates from this site. But, the Lothal sequence was not as long as that of Rangpur and it was not until 1985 (Rao 1985) that the ceramics were published in sufficient detail to be of use in the formulation of a regional chronology.

While no one has seriously doubted that Lothal A is a Mature Urban Phase Harappan settlement, the date for Lothal B has been more ambiguous. The full series of dates for Lothal is given in Table 3.

Table 3

Radiocarbon Dates from Lothal

Site/Lab No.	5568 Half-life B.P.	5730 Half-life B.C.	Calibration
Lothal A			
TF-136	3915±130 B.P.	2080±135 B.C.	2461 cal. B.C.
TF-22	3845±110 B.P.	2010±115 B.C.	2328 cal. B.C.
TF-27	3840±110 B.P.	2005±115 B.C.	2315 cal. BC.
TF-26	3830±120 B.P.	1995±125 B.C.	2299 cal. B.C.
TF-29	3740±110 B.P.	1900±115 B.C.	2181, 2166, 2142 cal. B.C.
TF-133	3740±110 B.P.	1900±115 B.C.	2182, 2166, 2142, cal. B.C.
TF-135	3405±125 B.P.	1555±130 B.C.	1735, 1717, 1701 cal. BC.
Lothal B			
TF-23	3705±105 B.P.	1865±110 B.C.	2134, 2059, 2048 cal. B.C.
TF-19	3650±135 B.P.	1810±140 B.C.	2034 cal. B.C.

It can be seen that even Lothal B, the period of decline, with a much reduced, impoverished site, falls within the third millennium B.C. and would be contemporary with Rojdi B, Kuntasi and Nagwada.

Concluding Remarks

tions for the chronology of the Harappan Civilization as a whole, especially the date for eclipse of the ancient cities of the Indus. A consideration of this magnitude is beyond the scope of this paper but it is hoped that some reasons have been given to begin to revise the thinking on the so-called "Late Harappan" sites of Gujarat.

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NOTES

1. Prof. Z.D. Ansari was a draftsman on M.G. Dikshit's excavation at Rangpur. He has told me that they found the site to be terribly confusing. For example, some of the sherds came from are now known as stud-handled bowls, one of the ceramic forms characteristic of the Sorath Harappan. The sherds with the stud on them completely baffled everyone at the excavation and Shaikh Ansari ended-up drawing them as scoops or sauce-pans (Dikshit 1950: Pl. XV, No. 11).

2. Calibration was done on the computer program CALIB.

3. Of course, this ignores the fact that the "standard" scheme was based on no dates at all.

Iron Age And Peninsular India

K.N. DIKSHIT

The Iron Age in South India in the States of Andhra Pradesh, Karnataka, Tamil Nadu and Kerala followed closely the end of the Neolithic period as there is no intervening Chalcolithic period and it begins whith the association of so-called Megalithic Black-and-Red ware which also coincides with the emergence of Megalithic monuments of one category or other. These megalithic monuments are concentrated in peninsular India but are also found sporadically in the rest of the country. Although Babington (1823), Meadows Taylor (1873) and Fergusson (1872) published about 'rude stone monuments' in the past but the scientific classification of megaliths was done by Krishnaswami[1] (1949). The excavation at Brahmagiri provided a firm date for Black-and-Red ware and its association with different types of megaliths in South India (Wheeler 1948:181-308). Since then a number of excavations have been carried out and the beginning of Iron Age in India has been pushed back (Agarwal 1982; Banerjee 1965; Chakrabarti 1986; Deo 1985; Dikshit 1986; Gaur 1984; Gupta 1972; Hegde 1981; Sahi 1979).

The Issue

The issues facing Indian archaeology at the present in this context are as follows:

(i) How the Iron technology evolved in south India, in other words, was it of indigenous growth or an import from either North India or West Asia or even Sri Lanka ?

(ii) What is the source of Black-and-Red ware in South India, Did it come from Maharashtra where it originated in Chalcolithic context at sites like Bahal, Prakash, Chandoli or it originated in Tinnevelly in the tip of Southern India around Kanyakumari or came from West Asia Via Malabar or else from Sri Lanka ?

The above two issues have been under active discussion for more than four decades in India but mostly in the context of Northern India and Western Asia. It never occurred to us that whenever we think about iron Black-and-Red ware and megaliths, we completely ignored the case of Sri Lanka where our colleagues are working for the last several decades. The fate of the archaeology of Sri Lanka vis-a-vis India has always been looked into the model of what is generally called the 'receiving end'. In this regard the fate of Indian archaeology was also the same. All the major cultures of India were thought to have come from western Asia. Not that such a premise is always wrong but the diffusive model of history has never allowed us to think that the story of civilization was partly autochthonous and partly diffusive.

Field Data

In the present paper, the results of excavations and explorations conducted recently in india specially those shedding valuable light on transition from Neolithic to Iron Age megalithic cultures have been discussed.

Ramapuram, Andhra Pradesh

The excavations at Ramapuram, District Kurnool, Andhra Pradesh, directed by B Narasimhaiah of the

Arrchaeological Survey of India,
Janpath, New Delhi.
Paper read in the Conference of South Asian Archaeological Congress at Columbo in 1987 organised under SAARC.

1 The old terminology requires modification. The dolmenoid cist of Krishnaswami (D2 or D3) is a dolmen. All the dolmens in the past were erected over the surface and cists below the ground and then Covered with cairns. The term dolmenoid cist is confusing in Indian context. The main megalithic types are dolmen, cist, passage grave and menhir. Rock cut cave is also one of the type (Dikshit 1969 : 85-89).

Archaeological Survey of India, established the cultural sequence in this region and also unfolded the characteristic features of the different phases (*IAR* 80-81. 3-7; *IAR* 81-82: 3-8; *IAR* 82-83: 3-6; *IAR* 83-84: 3-5). In an occupational deposit of 1 m,. which is divided into three phases, Period IA revealed handmade wares including grey, black and red, a microlithic tool industry, a pecked and ground stone industry and also a coiled copper wire. In IB microliths were absent and the frequency of painted red ware increased, whereas the last period IC which is further divided into three sub-phases, withnessed the introduction of iron technology. According to the excavator the grey and brown ware made remarkable improvement and emerged as the true Black-and-Red ware but also had some outside influence as revealed from the types like lid with finial and hour glass type stand. People lived in circular or oval huts with provision of slab piece lining on the exterior.

Four types of burials invariably oriented north-south covered by cairn packing but without circle stones were encountered in Period IC: pit, oblong cist, vertical single urn horizontal double urn and extended burial.

At a distance of 1.5 kms. from habitation site, 27 megalithic burials were noticed. Out of these four burials taken up for excavations turned out to be pit-burials and no skeletal remains were found.

Further exploration of the region revealed that these people lived on the banks of small streams which ultimately joined the river Pennar.

Banhalli, Karnataka

The excavations at Banhalli, District Kolar, Karnataka, directed by L.K. Srinivasan, B.S. Nayal and recently by B. Narasimhiah of the Archaeological survey of India (*IAR* 83-84, 42-46, *IAR* 85-86 (in the press) revealed from an occupational thickness of 5.50 m divided into 23 layers, the following cultural sequences:

Period	I	Neolithic (layers 23 to 17)
Period	II	Neolithic - Megalithic (layers 16 to 11)
Period	III	Megalithic (layers 10 to 8)
Period	IV	Early historic (layers 7 to 1)

The lowest period I was characterised by burnished buff, red and grey wares, the last one is having post firing painting on the rim portion. A painted red ware of medium fabric was also found. A portion of a circular house plan with a diameter of 3.20 metres and a potter's kiln were also encountered. In period II, an overlap between the Neolithic and the Megalithic cultures was seen. The typical megalithic types were encountered in Black-and-Red ware, Black ware and red ware. Among antiquities were circular and tabular beads of shell, quartz with bands, charred and polished bone stylus with cut marks, copper spoons and iron nails. The period III was pure megalithic culture. Main ceramic types in addition to earlier ones included funnel shaped lids with varieties of knobs. Besids the beads of glass, stones, copper and terracotta, a variety of iron objects like nails, heads, arrow heads and knife were also noticed. The last period IV revealed Black-and-Red ware, red slipped ware and well known russet-Coated painted ware commonly known as Andhra ware.

Hallur, Karnataka

The excavation at Hallur, District Dharwar directed by M.S. Nagaraja Rao of University of Karnataka showed a continuity between the late Neolithic-Chalcolithic and iron bearing Megalithic phases (*IAR* 64-65: 31-32).The period IA is pure Neolithic, but in IB painted black-and-red ware akin to the jorwe ware, copper implements and blade tools also made their appearance. In period II (Overlap) for the first time the presence of iron implements along with white painted Black-and Red ware was noticed. The iron bearing megaliths connected with this phase comprised cairns and dolemenoid-cist circles lying to the west of the site.

In the earlier excavations at Brahmagiri, the late levels of Period I were found overlapping in some layers with the Megalithic culture.

Paiyampalli, Tamilnadu

The site is located in District North Arcot at the foot and on the terrace of the hill called Talatapamalai. The excavations directed by S.R.Rao of the Archaeological Survey of India revealed a cultlural sequence starting from Neolithic up to the early historic period (*IAR* 64-65: 22-23). The period I represented by 1 m. thick deposit revealed handmade wares and polished ground stone tools. Special mention should be made of a terracotta figurine of long horned variety of cattle. Main pot-forms included lipped bowl, flared rim vessel, storage jar and dough plate. Microliths and metal were absent. Period II represented by 1.50 m. deposit revealed a variety of iron objects, terracotta figurines of birds and animals and bangles of glass and shell.

The main ceramic was Black-and-Red ware. In the late levels Russet coated painted ware made its appearance. Neoliths of earlier period also continued.

At the foot of the hill several megalithic stone circles were also noticed.

Other small scale excavations at the sites of T. Narasipur, District Mysore, Auroville in pondicherry, Mettur, District North Arcot and T. Kallupatti, District Madurai have revealed further details confirming the general pattern of Iron Age in Peninsular India. However, the excavations at Banhalli have provided a clear cut picture about the developmental stages of the transition from Neolithic to Iron Age.

Megaliths: Their Intrusion

O. Montelius advanced in 1874 at the stockholm Conference, three broad classifications of megalithic monuments: *'dos-ganggrift-hallkistor'*. It was later adopted after certain modifications by Nordman in 1932 for Scandinavia and by Sprockhoff in 1935 for north Germany. This classification also explains the origin of all the types of megalithic tombs found in western Europe (Daniel 1963: 56). In this connection it may be mentioned that there is no uniform 'Megalithic culture' in existence, it is only the generalized architectural forms of tombs constructed generally out of big stones which create the common link. The post-hole devices in the megalithic monuments of Peninsular India resemble similar devices in western Europe and west Asia. With this background, Gordon Childe (1947: 10) wrote that megaliths in India owe their origin to two important factors- (i) the diffusing of megaliths from west Asia to South Asia and (ii) the route followed which was perhaps maritime.

On these two counts for the last forty years, scholars like Haimendorf (1954), Thapar (1957), Soundara Rajan (1959), Banerjee (1965), Dikshit (1969, 1978), Ramachandran (1971), Gupta (1970-71), Gururaja Rao (1972), Sundara (1975), Subbayya (1978), Narasimhiah (1980) and Deo (1985) have been drawing attention to similarities that exist between the megalithic types of western origin and the megalithic types of Peninsular India. However, one important fact could never be established so far: if the diffusion was coastal, megalithic sites should have been earlier in date than the megaliths of hinterland. Unfortunately, none of the coastal megalithic sites in India have yielded dates earlier than the dates of megaliths of the hinterland.

Emergent Picture

The general trend of the evidence as it emerges from the above mentioned data is as follows:

(i) Whatever may by the origin of megaliths in India, the pre-megalithic forms of the disposal of the dead continued to exist in the megalithic period. This has also been the evidence gathered at Maski (Thapar 1957: 4 - 142).

(ii) The economic base of the pre-megalithic times in terms of limited agriculture (largely rice cultivation) continued during the megalithic period also.

(iii) The iron technology seems to have emerged out of the general knowledge about the copper-bronze metallurgy that existed, albeit in a restricted quantity in the pre-megalithic period generally called Neolithic and also Neolithic-Chalcolithic, This was almost clear even in the excavations conducted at Brahmagiri in 1946. Yet its real appreciation did not dawn upon us till the last decade when it was realised by the metallurgist that if a society has its cultural milieu some significant amount of knowledge regarding metallurgy, i,e., smelting and forging, it is not difficult to develop iron technology (Tripathi 1986: 75-79). It, therefore, appears that the technology of iron that had already developed in the states immediately north of south India, i.e., Maharashtra, between 700-600 B.C (Deo 1985) had enough potentiality to trigger the development of iron technology in the southern states particularly when we know that at many places in south India, iron ore is found in plenty. In this context the evidence of Hallur and Tadakanahalli require further confirmation as the Iron age habitations are not adequately explored and the sites so far known have flimsy deposits (Agarwal 1982: 257-261).

(iv) The absolute chronology of Peninsular megaliths is not established yet except that they are co-terminous with the Iron Age in the region. To solve this, we need to know the details of more habitational sites connected with different types of megalithic monuments.

It is generally believed that the iron technology and megaliths in sri Lanka emerged tentatively in a chronological context extending from 6th Century B.C. to 2nd Century B.C. The excavation at Gedige (the old capital of Anuradhapura) confirmed a culture sequence starting from Mesolithic followed by the Early Iron Age megalithic complex of India and finally an early historic phase distin-

guished by Rouletted ware (Deraniyagala 1980: 183). The history of the people of India and Sri Lanka may have been identical in the remote past and one day we might get the sites of Early Iron Age and Megaliths going back in time to the beginning of the Ist millennium B.C., if not earlier. To achieve this one has to work out the types of megalithic monuments in each region, relevant cultures associated with these monuments and their significance. Then only will it be possible for us to have a comprehensive idea of the Iron Age of Peninsular India and Sri Lanka.

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Megalithic Culture in North Arcot Region

K. RAJAN

The region under study is inclusive of North Arcot Dr Ambedker district and Tiruvannamalai Sambuvarayar district (11° 58' N to 13° 15' and 78° 45' to 79° 45' E). The recent explorations carried out in the region of Tamil Nadu yielded rich evidence of pre and protohistoric cultures. The study area is spread over about 12,265 sq.km. It is bounded on the north by Chittoor district of Andhra Pradesh, on the south, east and west respectively by South Arcot, Chingleput and Dharmapuri districts of Tamil Nadu. The Survey yielded about 10 palaeolithic sites, 5 neolithic sites, nearly 120 megalithic sites, 3 sites yielding rock paintings and a host of memorial stones.

The different explorations carried out through the years since the first discovery made in this district by F.J.Richards in 1916 have brought out a good number of megaliths spread over almost the entire district thereby throwing much light on various aspects of megalithic culture. More than hundred burial sites were brought to light in the present explorations alone. There are 44 sites yielding cairn circles, 38 sites with stone circles, 11 sites with dolmens, 18 sites with dolmenoid cists and one site with urn burial distributed some extent to certain specific geographical zones on this region.

Distributional Pattern

Unlike other parts of Tamil Nadu the present study area shows the evidence of inflow of three different megalithic traits. These3 distinct traits are confined interestingly to three separate geographical zones. The first trait which related tc the cairn circle category entered into this region along the river Pennaiyar probably from Dharmapuri district via Chengam pass The second one, that of stone circle variety entered into the eastern part of the region from the eastern part of Chittor district of Andhra Pradesh. The third trait, consisting of dolmen variety entered into this region from the western part of (Palamaner taluk) Chittoor district of Andhra Pradesh. The dolmenoid cist using multi orthostats, the degenerated form of cist or dolmen, might have evolved in the region itself or it would have made its way from Chingleput district where one could come across this type profusely. The above said four traits were superimposed as it were over the earlier sarcophagus burial trait of the area.

The concentration of cairn circles entombing cist with round porthole on the east could be observed on the west and south of Javadi hills comprising Tiruppattur, Chengam, Polur anad Tiruvannamalai taluks. This area is drained by the river Pennaiyar and its tributaries and river Cheyyar. As this area had a wide open pass of Chengam on its western border, naturally the cultural traits here got some inspiration from that direction. The distribution of cairn circles with cist burial is concentrated in the elevated zone of 200 - 500 MSL. Once the river reaches the plain below 200 MSL the concentration of cairn circles come down drastically. For instance, the taluks of Arni, Wandiwash and Cheyyar occupying the eastern part of this region fail to yield any megalithic traits. The burials were found in river valleys like those of Pennaiyar and its tributarties like Pamban flow in the southern part of Chengam taluk and another river Cheyyar flows in northern part of Chengam taluk

The Second geographical zone had much concentration of dolmens and dolmenoid cists. These types were observed only on the hill tops particularly concentrated west of Gudiyattam and east of jolarpet and on the Javadi hill tops. The Javadi almost joins with eastern ghats in the region between ambur and Jolarpet. The other side of the area is of

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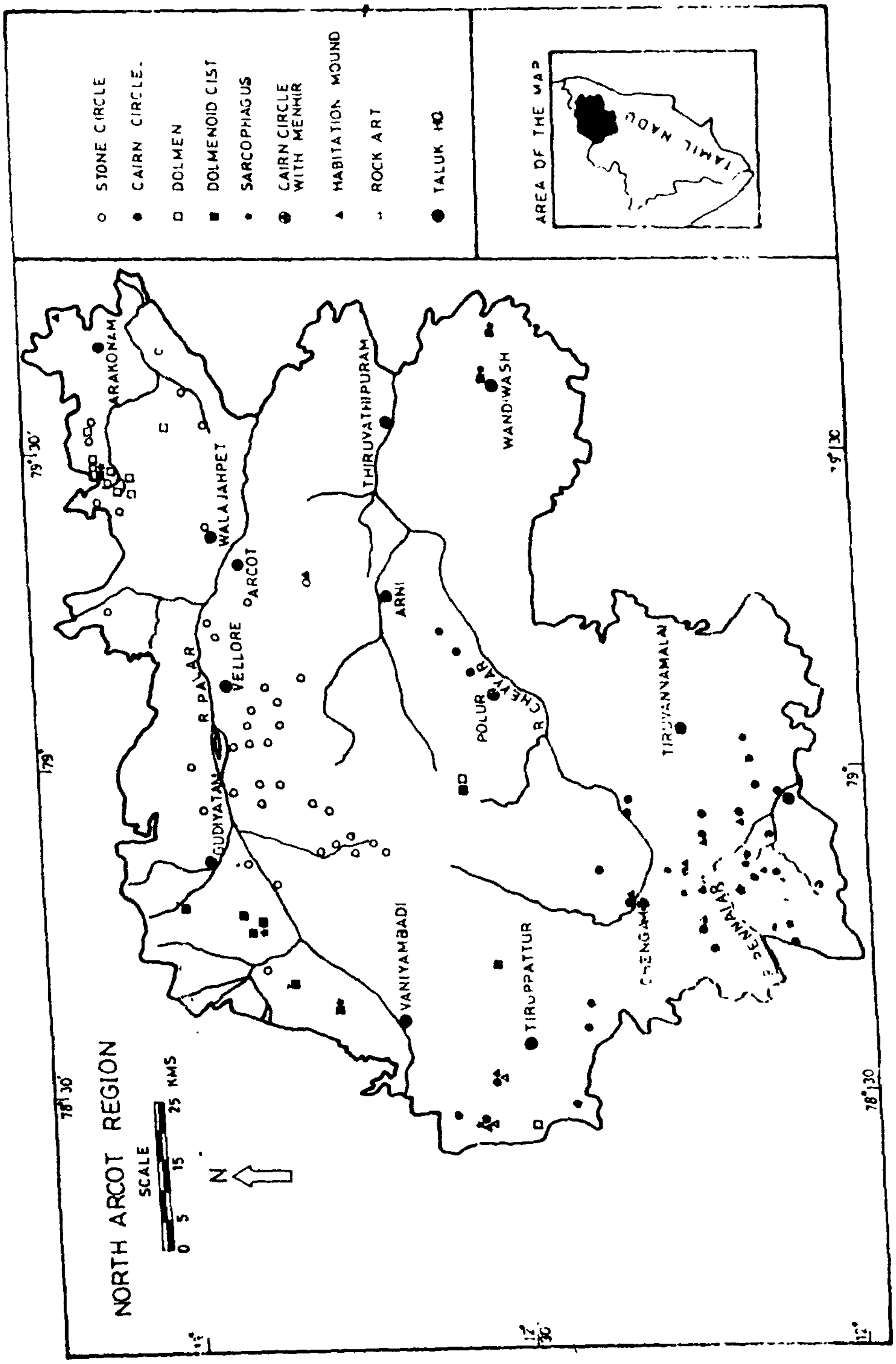

NORTH ARCOT REGION
SCALE
0 5 15 25 KMS
N
STONE CIRCLE
CAIRN CIRCLE.
DOLMEN
DOLMENOID CIST
SARCOPHAGUS
CAIRN CIRCLE WITH MENHIR
HABITATION MOUND
ROCK ART
TALUK HQ
AREA OF THE MAP
TAMIL NADU
ARAKONAM
WALAJAHPET
ARCOT
VELLORE
R PALAR
GUDIYATAM
VANIYAMBADI
TIRUPPATTUR
THIRUVATHIPURAM
WANDIWASH
ARNI
POLUR
R CHEYYAR
TIRUVANNAMALAI
CHENGAM
PENNAIAR
79°30'
79°
78°30'
12°30'
12°

Fig. 1

southern part of Chittor district where sites with dolmens and dolmenoid cists were reported. It seems dolmens and dolmenoid cists might have entered this region from the southern part of Chittoor district of Andhra Pradesh. These types hardly came to the plain region. They stayed in the vicinity of rivers or perennial ponds.

Another set of dolmens was observed in the northern part of Arakonam and Walajahpet taluk particularly in and around Sholigur. This region is also an offshoot of Chittoor district.

The stone circles were found in vellore, Walajahpet and Arcot taluks. Here, the narrow Palar valley leaves its ghat section and widens considerably in this area.

Types of Burial

The burials of this district can be broadly divided into four groups namely cairn circle, stone circle, dolmen and dolmenoid cist.

Cairn Circle

The cairn circles were constructed out of round boulders with heap of cairns at the centre. There are six types of cairn circles namely,

1. That entombing cist burial
2. That entombing pit burial
3. That with menhir
4. That with anthropomorphic
5. That with slab circle
6. That entombing sarcophagus

Cist Burial

Here, the cist was a box-like structure constructed of four orthostats kept in clockwise or anticlockwise direction on a floor and was enclosed by a capstone. The eastern orthostat had invariably a round porthole at the centre. On few occasions like at Odugattur the cist had a "U" shaped porthole found at the centre but on the top edge of the orthostat. Due to the hidden nature of the cist it is premature to say anything of its further classification. However, The data collected from some excavated burials like Mottur and in some disturbed cists suggested that the cists were not generally divided further to form what is called the transepted cist.

The excavations at Mottur in Chengam taluk revealed the nature of the burial in this region. In all four megaliths including the one with anthropomorphic figure were opened.

A pit was dug to an average depth of 75 cm and dressed orthostats of roughly 10-18 cm thickness were placed in *swastika* pattern to form a cist. The floor slab is absent. One or more sarcophagues were placed invariably in all the cists (Srinivasan 1978-79:72-73).

Pit burial

Three burials were opened at Paiyampalli in which one is completely disturbed. The rest two yielded a pit lined with stone slabs. One of the burials yielded a sarcophagus having 24 legs (Rao 1967-68:26). However the present writer had some reservation about the pit burial. So far no such pit burial lined with stone slabs were reported in the surrounding regions like Kolar, Chittoor and Dharmapuri districts. It seems the stone slabs may be a part of the orthostat of disturbed cist. The excavator himself reported that it was ransacked sometime after internment. Since it is a disturbed burial it could not be assessed categorically.

Menhir

Two sites namely Arapakkam in Walajahpet taluk and Thondamanur (Hanumanthappa 1978-79:21) in Chengam taluk are reported with menhir as a part of cairn circle. At Arapakkam the menhir is of pillar type having broad base and tapering body whereas at Thondamanur it is a tall slab. Two menhirs having 6 m and 5m in height respectively were seen planted on the western side as an integral part of the circle. These menhirs were the integral part of the slab circle reported earlier in the sites like Mottur. The occurrence of menhir, in general, is very few in this district.

Anthropomorphic figurine

A unique discovery of B.Narasimhaiah is a huge monolithic anthropomorphic figure found at Mottur in Chengam taluk 5 Km north of Tanipadi and 25 Km west of Tiruvannamalai (Narasimhaiah 1980:201-202). Similar figures were reported in Andhra Pradesh. Earlier William king reported cruciform monoliths on the right bank of the river Godavari at Kaperlaguru, located about 13 Km southwest of Mungapet in Paluncha taluk of Andhra Pradesh (William 1877:189-191).*

Mulhern noticed some crosses on the bank of Kaveri at Malur and Katapur (Mulhern 1868:166-118).

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* B.R.Mani has also reported a human figure carved in high relief on the rocky surface near the seven cairn circles at Curdi in Goa (IAR 1984-85:146). Editor.

Sundara and John observed at Ambala Vayal in Kerala certain projections like a head on the circular stone (Narasimhaiah 1980:203).

Recently K.P.Rao reported two identical anthropomorphic figurine at Midimalla near Chittoor (Rao 1988). The first one forming integral part of the slab circle kept around the dolmen. The dolmen was surrounded by two slab circles. The slabs having semi- circular top were placed on the cardinal points around the dolmen as one observed at Iralabanda (Branfill 1818:47-100) and Mallachandram (Rajan 1991:37-52). The anthropomorphics stand on the east in the outer slab circle the second one on the eastern side.

The second had a dolmen encircled with three slab circles. The circle slabs having semicircular top and flat or rectangular top planted alternatively around the dolmen. The slab having the semicircular top occupies the cardinal point. It seems in the mid circle the anthropomorphic figure seems to have evolved from the earlier one. The curvature of the arms and shoulders are well turned down. The neck portion had some "V" shape depression (Rao 1988) But the first one noted above did not have any depression instead it had small round projection.

The availability of slab circles in the western part of Chittoor district led to believe that the mottur anthropomorphic might have also derived the idea from there. To substantiate this recently one more anthropomorphic figurine identical to mottur type was brought to light at Udaiyarnattam in South Arcot District. This was also planted as part of the slab circle of a cairn circle.

Three cultural traits prevailed in Chengam area. For instance, the cist with round porthole came from Dharmapuri district via Chengam pass, the sarcophagus is either of a local tradition or derived from South Arcot and Chingleput region and anthropomorphic figure would have come from the western part of Chittoor through Javadi hills.

Anthropomorphic figures with head but armless were reported in northern Andhra Pradesh particularly on the south bank of Godavari at the sites like Tottigutta (Rao 1988) and Dongatogu (Ahmad 1950:1-4) in Khammam district of Andhra Pradesh.

Slab Circle

At Mottur and Thondamanur the cairn circle had a slab circle also. The slabs planted vertically into the ground had 10-20 cm height above the ground level. The excavation at Mottur yielded three concentric circles in which the outer two circles are built of stone slabs (Srinivasan 1978-79:73) At Thondamanur the outer circle is built of stone slabs. The anthropomorphic figure at Mottur and menhirs at Thondamanur stand part of this slab circle (Hanumanthappa 1978-79:21).

The cairn circle having slab circles were reported in the sites like Sittannavasal in Pudukottai district (Krishnaswami 1949:35-45), Nattukkalpalayam in Coimbatore district (Harding 1889-94:13-20), Mukkudivelanpalayam, Panchalingapuram, Brough Nagar (Rajan 1987:78-90) and kodumanal in Periyar district (Rajan 1990:95-102). Mungilpudur, ittikal agaram and Kuruvinayanpalli in Dharmapuri district (Rajan 1991.37-52).

The sites like Mallachandram, Maharajakadai in Dharmapuri district yielded slab circles around dolmen. The site Kuruvinayanapalli had slab circle around dolmenoid cist (Rajan 1991:63-64).

The occurrence of slab circles were observed in the burial types like cist, dolmen and dolmenoid cist led to believe that these slab circles were planted to impose certain singnificance of the burial Because generally the slab circles were found in one or two burials in a burial complex.

Sarcophagus

A vast majority of sarcophagi were of terracotta while a very few are of stone The stones are monolithic troughs. Such types are reported in the sites like Dongatogu (Ahmad 1950:1-4), Pandurangapuram (Rao 1988.25), Polichetticheugudda (Ahmad 1950:1-4) and Tottigutta (Rao 1988:25), all concentrated in the district of Khammam, Andhra Pradesh

The sarcophagi were mainly concentrated in the eastern coastal plain particularly north of river Pennaiyar in Tamil Nadu and south of Godavari in Andhra Pradesh. A few were also reported in inland regions in the sites like at Maski (Thapar 1957:4-142), Sankavaram (Raghavan 1974:29-31), Jadigenahalli (Seshadri 1956-57:34-35), etc. Another set of sarcophagus found against the Palaghat Pass in the districts of Trichur and Kozhikode in Kerala. Those sites are Chevayur (Logan 1887.179-183), Feroke (Aiyyappan 1923:299-314) and Kattankampal (Sharma 1956:93-115).

In Tamil Nadu, the sarcophagus is found in abundance in the district of Chingleput and northern part of South Arcot districts. The occurrence of sarcophagus sites drastically comes down south of river Pennaiyar. In the same manner the occurrence of urn burial increases south of Pennaiyar and decreases when one moves north of Pennaiyar It seems the sarcophagus and urn had similar mode of burial practices with slight variation in shape

The available evidence suggests that the sarcophagus had its origin in the eastern coastal plain between and Pennaiyar and moved slowly westward and merged with the local tradition of the respective area. In district Chingleput and northern part of South Arcot district, particularly in the coastal area, They were found in the pits or pit circles. While moving westward They show internment in the cists, dolmenoid cists and dolmens.

The occurrence of sarcophagus can be divided into the following manner.

1. Sarcophagus found in pits.
2. Sarcophagus found in pitcircles.
3. Sarcophagus placed as an internment in the cist.
4. Sarcophagus placed as an internment in the dolmenoid cist.
5. Sarcophagus placed as an internment in the dolmen.

The sarcophagus directly placed inside the pits seems indigenous and probably earlier than all other types. These types of burials were reported at Perambair in Chingleput district (Rea 1908-09:92-97). Quite interestingly one of the sarcophagi without legs recalls another form of coffin or urn burial. In addition to this two upturned clay hooks at both exterior ends of the sarcophagus were noticed. These types of hooks were also found on the interior surface near the rim portion of the urn in the sites like at Kalapatti in Coimbatore district (Rajan 1987:78-90).

The sarcophagi placed in a pit circle were reported at permbair (Rea 1908-9:92-97), Kunnattur (Krishnaswami 1955-56:23:1956-57;31-34; 1957-58:37-38), Sanur (Krishnaswami 1957:189-190) and Pallavaram (Bidie 1887:693-695) all located in the Chingleput district.

The above said two types were not noticed in North Arcot district. Obviously the reason is that of their western movement where they mingled with existing dolmenoid cists and dolmens.

The dolmenoid cist with sarcophagus internment was reported earlier at Karikal, Mamanadur, wandivasal (Narasimhaiah 1980:124-125) and in the present explorations at karkur, Pogalur and Kilseppuli.

The sarcophagus placed inside the cist in east-west orientation is reported in the excavation at mottur (Srinivasan 1978-79:72-73) and Odugattur (Richards 1934:157-165). The Present exploration also revealed such type at Sembadavankottai.

The dolmens with sarcophagus were found at Kilseppuli, Ariyur and Karikanthangal. The sites like Mallachandram in Krishnagiri taluk of Dharmapuri district (Rajan 1991:37-52), Devanur in Tirukkovilur taluk of South Arcot district (Garstin 1876:159) and Iralabanda in Palamaner taluk of Chittoor district (Branfill 1818:47-100), all located in the border area of this district, yielded sarcophagus burial.

The above said sepulchral representations clearly indicate the adaptive Trend of sarcophagus by various types of burial.

Types of Sarcophagus

The sarcophagi are generally a coffin with oblong or bathtub shape having cylindrical leg fluted at the bottom either in one or more rows. The sarcophagus found at paiyampalli had 24 legs (Rao 1964-65:22-23; 1967-68:26-30).

The sites yielding sarcophagus found in the coastal area had domical lid whereas the sarcophagus unearthed at Mottur (Srinivasan 1978-79:72-73) and Paiyamalli (Rao 1967-68:26-30) did not yield any lids. It can be conceded in other way too. The pit burial not having any capstone had lids whereas the cist, dolmenoid cist and dolmens having capstone had sarcophagus without lids.

Sarcophagus without legs was also reported at perambair (Rea 1908-09:92-97). This looks like was another form of urn burial.

Dolmenoid cist

A burial made of boulders or unhewn stones or rubble both for sides and cap. This oblong chamber generally had passage or wide opening on one side generally on the eastern side. Normally it does not have any porthole. Based on the construction of the chamber it can be divided into three types.

1. Chamber made of multiorthostats
2. Chamber made of rubble stones
3. Chamber made of boulders

The Chamber made of multiorthostats with passage on the east is reported earlier at Karikal in the Arakonam taluk. In the present exploration it is found at Kilseppuli and Andiappanur.

At Karikal the chamber measuring 3.40 m north-south and 2.70 m east-west is made of fourteen slabs with gap on the eastern side and encircled by two stone circles (Narasimhaiah 1980:125).

At Kilseppuli and Andiappanur the chamber is made of multiorthostats with a passage on the east which terminates at the circle. Here the circle is built of small rectangular slabs, almost in brick size and shape, placed in

courses around the chamber upto capstone. The whole part looks a fortification wall. This surrounding wall was detached against the passage. Unlike other places here the passage is found in all directions. Besides this, as a variant, one of the dolmenoid cists had eastern orthostat with imperfect "U" shaped porthole.

This type of "U" shaped porthole was also found at Karikantangal (Srinivasan 1953:103-115) and Odugattur (Richards 1954:157-165). Some of the portholes found at Kilseppuli are made slovenly.

These dolmenoid cists were generally raised 1 m to 2 m above the ground level.

The second type of dolmehoid cists were comparatively more in number and were reported in the sites like at Kilseppuli, Andiappanur, Karkur, Sempalli, etc. In this type, the chamber is built of four courses to the height of 30-50 cm. Sometimes they were placed like a wall without any gap between the rubble but on occasions they were placed at four corners. The chamber is surmounted by huge capstone which generally projects well beyond the chamber wall.

These chambers are encircled by a stone circle or wall like structure as one noticed at Karkur and Kilseppuli respectively. One of the dolmenoid cists at Karkur had two circles. The inner slab circle placed around the chamber was raised to the height of capstone and the outer stone circle placed at the base of the slab circle. In all the chambers the eastern side had a wide gap.

At Kilseppuli the dolmenoid cist had the opening of passage in all directions. These dolmenoid cists generally went to the height of 40 - 70 cm

The third type of dolmenoid cist had a chamber made of granitic boulders placed together or leaving a gap between the boulders. This oblong or a paraboloid chamber with passage or gap on the east is surmounted by a huge capstone. One of the dolmenoid cists at Mamandur is made of eleven rough and unhewn boulders with passage or on the east and encircled by boulders. such type noticed at Wandivasal (Narasimhaiah 1980:125).

All the above said types had the sarcophagus internment. It seems such type of burial might have emerged in the district of Chingleput where they are found in large numbers. The occurrence of such type of burials slackens down while moving southward or westward These types were found in the eastern part of Krishnagiri taluk in Dharmapuri district and Palamaner taluk in Chittoor district of Andhra Pradesh. Beyond this region, the availability of this type are negligible.

Dolmen

A burial Chamber made of four orthostats or slabs placed around the floor slab in clock or anticlockwise direction and closed with flat capstone. They were generally raised on the rocky surface on the hill top. The eastern orthostats invariably had a round porthole on the eastern side.

Such type of burials were noticed in the sites like at Ariyur, Ayepedu, Kilseppuli, Mahendravadi, etc. These dolmens were raised 1-2 m above the ground level and porthole had a diameter of 30-40 cm. Most of these sites were found in around Sholingur on the northern part of Walajahpet and Arakonam.

Urn burial

The only site reported with urn burial is at Kallerimalai excavated by the Madras University in the year 1978-79. The urn was placed on a bed rock buttressd on all sides by hard rocky soil upto lower half and by red *morrum* at the upper half. The urn was found sealed by a dump of loose prey soil and covered by a capstone. The globular shaped urn contained fragments of bones, a skull and a few black and red ware bowls, cups, etc (Raman 1978-79:73).

Porthole

The porthole was only on the eastern orthostat. There were two shapes namely round and "U" shaped porthole.

The round porthole invariably found in the dolmen and cist burial. The frequency of occurrence of the round porthole cannot be assessed due to its hidden nature. The sites Mottur and Sembadavankottai yielded this type in cist burial. The sites like Ariyur, Ayepedu, Ayal, Kilseppuli, etc., yielded dolmen.

The "U" shaped porthole was always observed in the dolmenoid cist. They were scooped out at the centre but on the top edge of the orthostat. This type of porthole was found at Odugattur (Richards 1954:157-165), Karikanthangal (Srinivasan 1953:103-115) and kilseppuli. This type is also reported in the neighboring Dharmapuri district in the sites like at Pachchikanapalli, Malththampatti, Pattakapatty, Bodampatti, etc (Rajan 1991:37-52).

Besides this, Kilseppuli two dolmenoid cists had a pot shaped porthole on the top edge of the orthostat whether this be imperfect form of the "U" shaped porthole depends on future findings.

Rock paintings

A megalithic habitation site at Mallapadi in Tiruppattur taluk was evinced with rock shelter paintings in white kaolin depicting the scene of two horse riders fighting with poles. Another human figure with upraised arms holding a stick or a weapon was also found (Raman 1977-78:50).

Recently one more rock painting site of Paiyampalli was brought to light by K.kumar of Madras University. The Paiyampalli rock paintings had fighting scene, dancing figure, horse raiders, flora, birds and sun motifs. The rock shelter at Chinnarayanapalli near Gudiyattam also has rock paintings.

Besides fighting scenes, cattle fighting or raiding, animal hunting are some of the themes found in the rock paintings. The rock shelter had the paintings on the roof. It seems these were executed periodically. The non-occurrence of habitation material in the shelters indicates that these were executed only on some special occasions.

List of Archaeological Sites in North Arcot Region

S.NO	Site	Taluk	Nature of site
1.	Agarampallipattu	CHE	Cairn circle entombing cist with round porthole on east Memorial stone (1)
2.	Aiyyathampalayam	CHE	Memorial stone (1)
3.	Alanganeri	GUD	Stone circle (3)
4.	Allapuram	VEL	Stone circle
5.	Ambarishapuram	AKM	Palaeolithic tools
6.	Ambur	VAN	Neolithic celts
7.	Anaicut	VEL	Stone Circle (10)
8.	Anandavadi	CHE	Memorial stone (1)
9.	Appukkal	VEL	Neolithic celts, Habitation-cum-burial, Stone circle, Memorial stone (1)
10.	Andiappanur	VAN	Habitation-cum-burial, BRW, Dolmenoid cist
11.	Andipatti	CHE	Habitation-cum-burial, BRW, Cairn circle, 143 lead coin hoard having brahmi legend *Atinnan edir ana Chendan*
12.	Arappakkam	WPT	Cairn circle with menhir
13.	Arattavadi	CHE	Cairn circle (500)
14.	Ariyur	VEL	Stone circle (10)
15.	Ariyur	AKM	Stone circle, Dolmen with round porthole on the east
16.	Attupakkam	AKM	Stone circle
17.	Arumpakkam	ACT	Middle palaeolithic
18.	Attipattu	POL	Dolmen with round porthole on the east
19.	Ayal	AKM	Dolmen with round porthole on the east
20.	Ayepedu	AKM	Stone circle (3), Dolmen with round porthole on the east
21.	Balur	GUD	Stone circle (2)
22.	Bontai	CHE	Cairn circle, Memorial stone (3)
23.	Chandrapuram	TIR	Neolithic celts
24.	Chengam	CHE	Habitation mound, Urn burial, Memorial stone (1), Fort
25.	Chennarayanapalli	GUD	Habitation mound, BRW, Memorial stone
26.	Chennasamudram	WPT	Palaeolithic tools
27.	Chinnakandili	TIR	Dolmen with round porthole
28.	Chinnamudalimuthur	TRI	Cairn circle
29.	Chinnayampettai	CHE	Habitation-cum-burial, BRW, Cairn Circle (5), Memorial stone (2), Fort, Erotic sculptures on the tank slabs
30.	Chinnur	TIR	*Sati stone*

List of Archaeological Sites in North Arcot Region

S.NO	Site	Taluk	Nature of site
31.	Durgam	ACT	Habitation-cum-burial, BRW, Stone circle
32.	Edakkal	CHE	Memorial stone (1)
33.	Edathanur	CHE	Memorial stone (1)
34.	Elangunni	CHE	Memorial stone (1)
35.	Elavambadi	VEL	Stone circle entombing cist
36.	Erandanthankarai	CHE	Cairn circle entombing cist with round porthole on east, Memorial stone (1)
37.	Eripallam	VAN	Stone circle
38.	Govindarajapuram	CHE	Cairn circle
39.	Guddalore	POL	Cairn circle (12)
40.	Jambukulam	WPT	Microliths (?)
41.	Kadaladi	POL	Memorial stone (8)
42.	Kakangarai	TIR	Cairn circle (25)
43.	Kalathiyur	TIR	Memorial stone (1)
44.	Kalathur	AKM	Palaeolithic tools
45.	Kalkuttaipudur	TIR	Memorial stone (8)
46.	Kallerimali	GUD	Neolithic celt, Habitation mound Urn burial
47.	Kambattu	CHE	Cairn circle
48.	Kandaneri	VEL	Stone circle (10)
49.	Kaniyambadi	VEL	Stone circle
50.	Kaniyanur	ACT	Palaeolithic tools
51.	Kannakandal	CHE	Memorial stone (1)
52.	Kannamadam	TVM	Cairn circle, Memorial stone (1)
53.	Karapattu	CHE	Memorial stone (1)
54.	Karapattu	VAN	Dolmenoid cist (25)
55.	Karikal	AKM	Dolmenoid cist of multiorthostats encircled with slab and boulder circle, Sarcophagus
56.	Karikanthangal	AKM	Dolmenoid cist with U-shaped porthole on the east
57.	Karkur	GUD	Dolmenoid cist (50)
58.	Karungalipadipatti	CHE	Memorial stone (4)
59.	Kathericuppam	VEL	Habitation-cum-burial, BRW, Stone circle (50)
60.	Kathiyavadi	WPT	Stone circle (3)
61.	Kattamaduvu	CHE	Memorial stone (1)
62.	Kavanoor	GUD	Habitation mound, BRW
63.	Keelarasampattu	VEL	Habitation mound,BRW
64.	Keelkothur	VEL	Habitation-cum-burial, BRW,Stone circle (50)
65.	Kilasilambadi	CHE	Polished stone axes
66.	Kilkachirapattu	TVM	Memorial stone (1)
67.	Kilpalur	POL	Memorial stone (1), Inscribed slab
68.	Kilpasar	CHE	Cairn circle entombing cist with round porthole on east
69.	Kilpatti	GUD	Habitation mound, BRW
70.	Kilravandavadi	CHE	Habitation-cum-burial, BRW, Cairn circle entombing cist with round porthole on the east, Memorial stone (1)
71.	Kilseppuli	POL	Dolmenoid cist (200) and Dolmen (10)
72.	Kilvilampuchchi	CHE	Polished stone axes
73.	Kilvenpakkam	AKM	Palaeolithic tools

List of Archaeological Sites in North Arcot Region

S.NO	Site	Taluk	Nature of site
74.	Kodaikal	WPT	Dolmenoid cist
75.	Koluthampattu	CHE	Neolithic Celts, Cairn circle, Memorial stone (1)
76.	Konakuttai	CHE	Habitation-Cum-burial, BRW,Cairn circle (50), Memorial stone (1)
77.	Kondakuppam	WPT	Inscription on a boulder
78.	Kosavanpudur	GUD	Habitation Mound, BRW, Memorial stone
79.	Kothur	TIR	Habitation mound, BRW
80.	Kottaiyur	CHE	Memorial stone (4)
81.	Krishnapuram	AKM	Historical habitation mound, Furnace, Iron slag
82.	Kukkalpalli	GUD	Rock shelter with stone bed
83.	Kumbalamarattu	CHE	Dolmenoid cist
84.	Kuppam	VEL	Stone circle
85.	Kuppanattam	CHE	Historical habitation mound
86.	Kuppukalmedu	WPT	Stone circle
87.	Kurumberi	TIR	Cairn circle
88.	Kurusilapattu	VAN	Stone circle (?), Memorial stone (1), Portrait sculpture
89.	Kuttathur	CHE	Neolithic celts
90.	Mahendravadi	AKM	Dolmen with round porthole
91.	Malayampattu	VAN	Neolithic Celt
92.	Mallapadi	TRI	Habitation-cum-burial, Cairn circle, Rock painting
93.	Mamandur	WAN	Dolmenoid cist of multiorthostats with Sarcophagus
94.	Mangalam	TVM	Historical habitation mound, Memorial stone(1)
95.	Manikkal	CHE	Memorial stone (1)
96.	Matheri	AKM	Stone circle
97.	Mattapattu	POL	Memorial stone (1)
98.	Melpallipattu	CHE	Memorial stone (1)
99.	Melpasar	CHE	Cairn circle entombing cist with round porthole on east
100.	Melpunjai	CHE	Cairn circle (100), Memorial stone (1), Inscribed slab
101.	Melravandavadi	CHE	Cairn circle (20), Memorial stone (2)
102.	Mettuppalayam	POL	Cairn circle (10)
103.	Melakuppam	WPT	Stone circle
104.	Melarasampattu	VEL	Stone circle (3)
105.	Melpatti	GUD	Habitation mound, BRW
106.	Melvaithankuppam	GUD	Memorial stone (3)
107.	Mittalam	VAN	Dolmenoid cist (20)
108.	Mottakkal	CHE	Cairn circle entombing cist with round porthole on the east (100), Memorial stone (2)
109.	Mottur	CHE	Anthropomorphic slab, Cairn circle with round porthole on the east, Sarcophagus
110.	Munnurmangalam	CHE	Habitation-cum-burial, Cairn circle (10), Vishnu, Vishnu sculpture
111.	Murugappadi	POL	Cairn circle (10)
112.	Musiri	WPT	Palaeolithic tools
113.	Muthukumara	VEL	Habitation-cum-burial, BRW, Stone circle (100) velmalai
114.	Nagal	GUD	Stone circle (8)
115.	Nagavedu	AKM	Palaeolithic tools
116.	Nallapattu	CHE	Dolmenoid cist

List of Archaeological Sites in North Arcot Region

S.NO	Site	Taluk	Nature of site
117.	Namakkal	CHE	Cairn circle
118.	Namindal	TVM	Memorial stone (1)
119.	Narasinganallur	CHE	Memorial stone (1)
120.	Narayanakuppam	CHE	Fertility stone (*sanniyasikal*)
121.	Nasandal	TVM	Cairn circle (50)
122.	Neepathurai	CHE	Historical habitation mound
123.	Nellivasalnadu	TIR	Neolithic Celts
124.	Odugattur	VEL	Stone circle (20), Cist with U-shaped porthole
125.	Padiagraharam	CHE	Memorial stone (2)
126.	Pahaveli	WPT	Palaeolithic tools
127.	Paiyampalli	TIR	Habitation-cum-burial, BRW, Cairn circle, Sarcophagus, Rock paintings
128.	Palaya Talur	CHE	Neolithic celts
129.	Pallalakuppam	GUD	Dolmen (60)
130.	Pallathur	GUD	Fertility stone (*sanniyasikal*)
131.	Pandyanallur	WPT	Stone circle, Inscribed slab
132.	Paramanandal	CHE	Historical habitation mound
133.	Paranji	AKM	Stone circle (5)
134.	Patchoor	TIR	Cairn circle (20)
135.	Pennattur	VEL	Stone circle
136.	Periya Eriyur	VEL	Stone circle (20)
137.	Periyakolapadi	CHE	Memorial stone (2)
138.	Periyakolthambadi	CHE	Memorial stone (1)
139.	Perumuttam	CHE	Dolmenoid cist
140.	Peruvalayam	AKM	Stone circle (3)
141.	Pinjur	CHE	Habitation-cum-burial, BRW Cairn circle (100), Memorial stone (2)
142.	Pinnathurai	VEL	Habitation mound, BRW Stone circle (25)
143.	Pogalur	GUD	Dolmenoid cist, Memorial stone
144.	Polur	POL	Cairn circle (5)
145.	Polur	AKM	Jaina sculpture
146.	Pudur	CHE	Cairn circle
147.	Pudur	TRI	Memorial stone (6)
148.	Pudurchekkadi	CHE	Cairn circle (20)
149.	Pudurnadu	TRI	Neolithic celts
150.	Pudupattu	CHE	Inscription of trade guild
151.	Pulimedu	VEL	Habitation mound, BRW, Stone circle (5), Memorial stone (4)
152.	Pulivalam	WPT	Dolmen with round porthole on the east
153.	Puliyur	CHE	Neolithic tools
154.	Rajakkal	GUD	Inscrintion on a Boulder
155.	Reddiyarpalayam	CHE	Carin circle entombing cist burial having round porthole on the east
156.	Sadupperi	POL	Historical habitation mound
157.	Samanthipuram	CHE	Memorial stone (1)
158.	Sanarpalayam	POL	Historical habitation mound
159.	Sattanur	CHE	Habitation-cum-burial, BRW Cairn circle entombing cist, Memorial stone (5)
160.	Seduvalai	VEL	Habitation-cum-burial, BRW, Stone circle
161.	Se. Guddalore	CHE	Memorial stone (1)

List of Archaeological Sites in North Arcot Region

S.NO	Site	Taluk	Nature of site
162.	Sembedu	VEL	Historical habitation mound
163.	Sembadavakottai	CHE	Cairn circle entombing cist having round porthole on the east with sarcophagi
164.	Sempalli	GUD	Dolmenoid cist (20)
165.	Sengundram	GUD	Historical habitation mound
166.	Sennandipatti	CHE	Cairn circle
167.	Serpadi	VEL	Stone circle (20)
168.	Sholavaram	VEL	Historical habitation mound
169.	Sholingur	WPT	Neolithic Celt, Stone circle
170.	Sudampattu	TIR	Memorial stone (5)
171.	Surai		Dolmen with round porthole on the east
172.	Takkolam	AKM	Palaeolithic tools
173.	Tanipadi	CHE	Cairn cirdle (5), Fertility stone (*sanniyasikal*)
174.	Thalaiyuttu	CHE	Habitation-cum-burial, BRW, Cairn circle (500), Memorial stone (4)
175.	Thalikal	AKM	Dolmen with round porthole on the east
176.	Thandarampattu	CHE	Memorial sotne (2)
177.	Thenmudiyanur	CHE	Cairn circle entombing cist with round porthole on east, Memorial stone (1), Sluice with Inscription, Fertility stone (*sanniyasikal*)
178.	Thiruvidattanur	CHE	Cairn circle, Fertility stone (*sanniyasikal*)
179.	Thondamanur	CHE	Cairn circle entombing cist with round porthole on east, Two menhir found part of a circle, Memorial stone (1)
180.	Thorapadi	CHE	Memorial stone (2)
181.	Tirumalai	POL	Habitation-cum-burial, cairn circle, Jain temple
182.	Tirumalpur	AKM	Palaeolithic tools
183.	Tirupanmalai	ACT	Stone circle (5), Memorial stone (1)
184.	Tiruvannamali	TVM	*Mahishasuramardani* Sculpture of Pallava style
185.	Torappadi	VEL	Historical habitation mound
186.	T.Velur	CHE	Memorial stone (1)
187.	Ulli	GUD	Stone circle
188.	Unai	VEL	Stone circle (6)
189.	Urkkavundanur	CHE	Neolithic celts
190.	Usoor	VEL	Habitation-cum-burial, BRW, Stone circle
191.	Vallakad	CHE	Cairn circle
192.	Vallimalai	WPT	Cairn Circle entombing cist with round porthole on east
193.	Vaniyan Chatiram	WPT	Palaeolithic tools
194.	Vannanthangal	VEL	Stone circle entombing cist
195.	Vasoor	POL	Historical habitation mound
196.	Vasudevanpattu	CHE	Cairn circle
197.	Vedakuppam	CHE	Cairn circle, Memorial stone
198.	Vedapudupattu	VAN	Stone circle
199.	Veeranam	CHE	Memorial stone (2)
200.	Veerappanur	POL	Dolmenoid cist
201.	Veppancuppam	VEL	Stone circle
202.	Veppurchekkadi	CHE	Dolmen with round porthole on the east with Sarcophagus, Memorial stone (2)
203.	Vettangulam	AKM	Stone circle (10)
204.	Vinnamangalam	VAN	Neolithic celt

List of Archaeological Sites in North Arcot Region

S NO	Site	Taluk	Nature of site
205.	Vishamangalam	TIR	Cairn circle (20)
206.	Walajahpet	WPT	Stone circle
207.	Wandiwash	WAN	Dolmenoid cist of mutiorthostat with sarcophagus

ACT - Arcot	POL - Polur	VEL - Vellore
AKM - Arakonam	TIR - Tirupattur	WAN - Wandiwash
CHE - Chengam	TVM - Tiruvannamalai	WPT - Walajahpet
GUD - Gudiyatam	Van - Vaniyambadi	

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Settlement Archaeology of Kaothe: A Chalcolithic Site in the Tapi Basin

VASANT SHINDE

The Site and its Environment

The village Kaothe (Lat. 21°00' N; Long. 74° 18' E), in Sakri Taluka, Dhule district of Maharashtra, lies on the bank of the river kan, a tributary of Panjrha, which in turn is one of the major southernly tributaries of the Tapi. It is situated at a distance of 4 km west of Sakri town and 52 km northwest of Dhule city.

The ancient site, roughly half a kilometer west of the present village, is located on the left bank of the river Kan, which, as it originates in the western Ghats, is perennial. The river has developed a shallow meander here and the ancient site is located in the inner periphery. It is situated on a 7 to 8 m high alluvial flat surface. The settlement is roughly oblong in shape and covers an area of nearly 30 ha. The occupation debris is shallow which varies from 50 to 80 cm. The entire upper stratum of the site has been disturbed because of cultivation. We were told by the villagers that there was a mound of considerable height till some 50 years ago, but was flattened gradually to the present level in the process of agriculture.

When the site was first visited by the authour, he thought that it belonged to the Late Harappan culture mainly on account of the presence of high percentage of Harappan pottery in the ceramic assemblages (Shinde 1985). However, it was the subsequent excavation of the site which revealed its true cultural sequence. The site was occupied by the first farmers of Maharashtra, the people of the Savalda culture in the beginning of the second millennium B.C. (Dhavalikar and Shinde 1989; Dhavalikar *et al.* 1990).

The explorations in the Tapi valley have brought to light a series of 28 sites of Savalda culture, the first site of which was discovered at Savalda village located on the left bank of the river Tapi (Nandurbar Taluka, Dhule District, Maharashtra state). The small excavation of this site carried out in 1958 (IAR 1957-58) was of little assistance to ascertain the chronological and stratigraphical position of the culture. The culture was dated properly on the basis of a few radiocarbon resolution, obtained from the excavation at Daimabad (Ahmednagar District, Maharashtra State), to the beginning of the second millennium B.C., where it was found underlying the Late Harappan debris (Sali 1986). Since the Savalda culture is the first farming community of Maharashtra, it was decided to excavate this site on a large scale to know more about its material equipment and the lifestyle of its people.

The region around kaothe falls in semi-arid zone with an annual precipitation ranging from 400 and 500 mm. The site is surrounded by good arable land (deep and medium black cotton soils) and the opposite bank constitutes vast reservoir of pasture. The area within 5 km radius from the ancient site is, at present, sparsely wooded and therefore 60 to 70% of the land is under cultivation (Pappu and Shinde 1990). The natural vegetation around Kaothe consists mainly of thorn and scrub type forest represented by xerophytic plant species. A number of varieties of birds and small games are found in the nearby Reserved Forest. Pools in the bed of river Kan abounds in fish and crab. Geologically this region is covered by Cretaceous-Eocene Deccan Trap basalt and there are no later formations except the Older

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Alluvium of late Pleistocene age and sub-recent alluvium of the mid-Holocene age. Gravel beds near the site contain appreciable amount of sub-angular to sub-rounded pebbles mostly of chalcedony and a few agate, jasper, chert, amethyst, milky quartz and opal (Pappu and Shinde 1990).

Prior to this excavation, the important characteristic features of the Savalda culture identified as a result of large scale excavation at Daimabad included rectangular mud structures having wattle-and daub walls on three sides, well developed blade industry, restricted use of copper, beads and bangles of semi-precious stones and conch shells respectively, etc. The excavation at kaothe has, however, revealed some new features of this culture such as pit-dwellings, almost absence of copper and blade tools, profuse occurrence of bone tools and remains of human burials within the habitation area. In all five burials, three of adults and two of children, were found, which were confined to the western part of the habitation. Adults were buried in supine position, whereas the children were placed in crouching posture in oblong pits in north-south position with the head towards the north and the legs towards the south. Unlike the custom of Jorwe people, the feet of the dead were not chopped off. There were no burial goods.

The Ceramic Assemblage

The ceramic assemblage from Kaothe can be divided into two broad catergories: the painted and unpainted coarse. The former includes three wares, namely, the sturdy Red, the Savalda and the Kayatha. The first among them is made on a fast wheel whereas the pots of the remaining two are fashioned either on a slow wheel or they are hand modelled. The sturdy Red ware, made from extremely well levigated clay, is uniformly fired to a high temperature as the fully oxidized core would indicate. The fabric is sturdy and often thick. The external surface of pots bears wash of pinkish or pale red colour. The repertoire of forms in this ware is extremely limited; it includes convex-sided bowls, basins, globular pots and dishes. There are two varieties in bowls-deep and shallow, both with featureless rims. The various rim forms in the basin type include flat projecting, rounded and slightly undercut, thickened rounded and clubbed. The globular jar is the predominant form, in which the type with as narrow mouth, externally thickened rim, sloping shoulders, globular body and a flat base is quite common. Almost all the pots of different forms in this ware provided with flat bases. The painted designs, which were executed in either purple or light black, were confined to the upper half of the vessel. They include mostly linear patterns such as broad horizontal bands, zig-zag lines between horizontal bands, sets of oblique strokes, oblique strokes set in horizontal bands, *jali* pattern and some curvilinear pattern such as loops. No naturalistic motifs have been found painted on these pots.

The Savalda ware, rather coarse in fabric, is the predominant in the ceramic assemblage of Kaothe. The core is very often gritty showing inpurities and is also unoxidized indicating that it was not fired at a uniformly high temperature. Thin and thick varieties are found and most of the pots of this ware appear to have been made on slow-turned table. The outer surface is treated with different shades of colour consisting of pink, chocolate and red. The types in this ware are extremely few such as globular pots with high necks and round bottom, globular pots with high but very narrow neck, convex-sided bowls and Indian *Iota* like. The Savalda ware is a unique in the entire ceramic range of Chalcolithic Deccan because of the variety of delicatley painted motifs in black pigment. These include, besides Liner and geometric patterns, vast number of wild animals and birds, such as the elephant, the wild boar, peacock, cock snakes and aquatic creatures like a variety of fish and frogs. Even arrows, bows and harpoons are also depicted. All these painted motifs have been executed with great care and display the mastery of the Chalcolithic artists.

The other painted ware associated with the Savalda culture at Kaothe is the Kayatha ware. It is characterized by a sturdy fabric and is extremely fine as compared with the Savalda ware. It has a thick brown or pinkish slip on the external surface with broad zones of chocolate over it. On many potsherds only Chocolate zones are seen. The painted decorations in red seen on the vessels in this ware are mostly vertical and horizontal bands and very rarely a *jali* pattern. Globular jar with high necks is the predominant type. Other varieties in this type include jars with outcurved rim, jars with externally thickened rims jars with beaded rims. There is a fragment of a jar with a flaring mouth, carinated body and round bottom (Dhavalikar *et al.* 1990). The other associated coarse wares found in the Savalda levels are not much different form the similar wares other Chalcolithic cultures, particularly the Malwa and the Jorwe of the Deccan.

Potter's kiln

The discovery, in the eastern margin (Square M4) of the site, of a roughly circular pottery kiln at Kaothe suggests that the different ceramic wares found were fired in it. The area was marked by the presence of a number of clods of burnt earth and large flat stones. After complete exposure, this structure looked like from the Malwa and Jorwe levels at Inamgaon (Shinde 1991 a). The potter's kiln found at

kaothe was built in situ. It is roughly circular in plan with a long passage (fire chamber) on its north. It is lined with flatish stones, some of which were missing. On the interior as also exterior, the stones were lined with earth, which has burnt red obviously because of constnat use. The internal diameter of the kiln is 2 m. The length as also the width of the fire-chamber is 1.10 m. It must have been longer still but in the northern end it has been destroyed by a later pit. Inside the kiln were found vitrified potsherds and charcoal pieces. The structure, as already suggested, resembles in all essential details the potter's kilns of the Malwa and Early Jorwe periods from Inamgaon. The only important difference is that the Inamgaon kilns had floors with radiating flues which were located the fire-Chambers (Dhavalikar *et al.* 1988). It is highly likely that the upper part of the kiln has been destroyed and what we see is only its base.

The dwelling Structures

The new feature of the Chalcolithic architecture (dwelling structures) brought to light by the excavation at Kaothe was the pit-dwellings. Earlier three pit-dwellings were unearthed in the Malwa levels in course of the excavations at Inamgaon, of which only one (House 50), on the basis of well made sides and bottom and the presence of fire-pit inside, appears to be a real dewelling structure. Almost all the excavated Chalcolithic sites in central India and the Deccan have yielded the evidence of either rectangular or circular mud houses.

The pit-dwelling was usually circular in plan, its average diameter being 1.75 m. The depth varied from 20 to 40 cm. Both, the bottom and sides of the pit were plastered with clay and cow dung. The post-holes along the periphery of some of the pits, confirmed that the roof was supported by wooden posts. Deep pit-dwellings were constructed by the Neolithic people at Burzahom in Kashmir, which were most probably intended to protect themselves from intense cold (Kaw 1979). In this region, which fall in semiarid zone, the climate never never drops so low and hence such deep pit-dwellings would never be required. Besides, the dwellings found at kaothe are so shallow that hardly they will serve the purpose of offering protection from cold climate. An ethnographic survey carried out in the Deccan revealed that economically poor families in this area use these type of pit-dwellings (Shinde 1991b). The purpose of building pit-dwellings is that the poor families cannot afford to buy wooden posts of desired length, and in order to obtain sufficient height for the hut, the pit is dug. we do not know whether the Chalcolithic people at Kaothe constructed pit-dwellings out of such compulsion.

From the clusters of pit-dwellings, it appears that each household consisted of several pits meant for purposes other then living, like storage, cooking, etc. Besides, in almost each cluster was found one hut with a small depression in it. The modern parallels enable identification of such pits as poultry, and the small depressions found in them were possibly meant for hens to lay eggs. Storage pits contained remains of huge jars of coarse handmade variety. The living pits had well made floor and they were slightly larger in size when compared with other nonliving types. These dwellings did not indicate a permanent occupation at the site. on the contrary the flimsy floors indicate a seasonal occupation. The domestic heart in the kitchen did not provide evidence of the use over an extended period. The floor and sides of *Chulah* were not burnt red as they should have if they were used for a prolonged period.

Three different localities within the site were selected for excavation. In the eastern (KTE-I) and central (KTE-II) parts were exposed 17 pit-dwellings each, whereas the western (KTE-III) locality yielded eight such structures. There appears to be three clusters in the eastern part (KTE-I). Each cluster has been identified on account of presence of domestic hearths. The Cluster 1, consisting of pits 1,2 and 3, has a *chulah* located outside, very close on the eastern side of Pit 2. Pit 1, irregular in plan, appears to be living unit of the cluster as it is the largest of them. The functions of Pits 2 and 3, which are identical in dimensions (dia. 1.50 m and 15 m deep), could not be ascertained as they have not produced any evidence in this respect. Cluster II, consisting of Pits 4 to 7, is located to the west of Cluster I. Pits 5 and 7, with diameters of 1.20 m and 1 m respectively, appear to be cooking and storage places. The kitchen of the cluster could not be could not be located as the adjoining area is not dug. Cluster III, south of Cluster I, appears to be thed largest of three as it includes 10 pits (Nos. 8 to 17). Pits 16 and 17, large in size with with a number of post-holes along their periphery and having well made floors, could be identified as living huts of the complex. Pit 16 has a diameter of 2.60 m and is 10 cm deep. It has 10 post-holes around the margin, which obviously supported the roof and the entrance was provided in the northeastern side. The entrance is roughly rectangular, 16 cm wide and 45 cm long. Pit 17, roughly oval in plan with a maximum dia. of 2.90 m and 10 cm deep, has a series of 8 post-holes along its periphery. The entrance was provided in the northeast as the curved portion would suggest. Pit 11, 1.75cm in diameter and 25 deep with a comparatively well made floor, appears to be the part of kitchen as it yielded a saddle quern. Pit 15, with a small depression in its southern end, could have been used for keeping poultry. Pits 10, 12 and 14 could be interpreted as

storage on account of their small dimensions. The domestic hearth of the complex could not be traced, most probably because it lay in the eastern part, which is not dug.

From the study of the location of 17 different pits, unearthed in the KTE-II locality it can be them occupied pits 18 to 21. Pit 18, which is 1.85 m in diameter and 32 cm deep, appears to be the kitchen of the complex. In the western part of this pit remains of a small clay *chulah,* with a curved sides and a passage of 30 cm wide, were noticed. It resembles the two armed *chulah,* which is presently being used in the villages of Maharashtra. However, the domestic hearth found in the excavation does seem to have been used much because there is hardly any evidence of intense burning activities. Pit 19 (dia. 1.85) could be the dwelling of this complex for the simple reason that it has a well made floor and lack of the evidence of any other activities. The other cluster, which includes pits 22, 23, 24, 25, 26, 27, 30, 31, and 32, is, far the largest excavated in this locality. Pit 30, 1.85 m in diameter and 5 cm deep, has a series of 7 post-holes along its periphery. It has a rough floor. It is not unlikely that a circular storage bin of wicker work and plastered with mud stood at this place. The existence of post-holes suggests that it may have been covered by a roof. Pits 24 (dia. 1.60m) and 25 (dia. 1.95) interconnected and having well-made floors could have been used for purposes. The kitchen of the complex was possibly located in pit 23 (dia. 1.75) as there are lumps of burnt earth and ash deposit, indicating the remains of domestic hearth. Pits 22 (dia.65 cm and depth 40 cm), 26 (dia. 80 cm and depth 50 cm), 31 and 32 (dia. 95 cm and depth 50cm) appear to be storage silos of the complex. Pit 27 with two depressions (dia. 40 c,m and depth 25) in it could be identified as a poultry pit of the cluster. Pit 29, very close to the second cluster in this locality, is oval in plan and is by far the largest pit-dwelling found at the site. Its maximum length is 5.60 m and is 3.65 m wide. Along the periphery it has 16 post-holes. There is no evidence of domestic activities such as cooking and therefore its exact function is not known. It would not be far fetched to surmise that it was a public building meant for holding meetings and other ceremonies.

Altogether eight pit-dwellings were exposed in KTE-III, of which Nos. 35, 36 and 37 seem to belonged to one bousehold. to one household. An oval-shaped pit (No.37) with a series of eight post-holes along the periphery and comparativley large in size (length 2.75 m x width 1.80 m and 5 cm deep) could be a living. Pit 36, 1.35 m in diameter and 15 cm deep could be the storage of the complex. Very close to this pit were noticed the remains of fire-place. most of the other pits such as Nos. 38 (dia. 95 and depth 30 cm), 39 (dia. 1.45; depth 1.20m), 40 (dia 60 cm; depth 10 cm), 41 (dia. 75; depth 65 cm) located roughly 5 cm away to the southeast of the main complex in this locality appear to be storage silos. It is in this locality that five human burials were encountered (Dhavalikar *et al.* 1990).

Subsistence Economy

These people practiced subsistence agriculture combined with stock raising and hunting/fishing. Considering the abundance of good arable land on the northen side of the ancient site, the primary aim of establishing a settlement appears to be to exploit its potentiality. They cultivated pearl millet (Bajra) (*Pennisetum typhoides* Stapf. and Hubbard), horse gram (*Dolichos biflorus* Linn.), black gram (*Vigna mungo* (L) Hepper) and sesame (*Sesamum cf indicum* Linn) (Kajale 1990). The earliest evidence of *bajra* so far comes from Rangpur (Surendranagar District, Gujarat) where it occurs in Period III, dated to c. 1200-800 B.C (Possehl 1989). it evidence from Kaothe takes back the antiquity of *bajra* to the beginning of second millennium B.C. However, Kajale (1990), who studied the plant remains remains from this site, has cautioned against using the evidence of *Bajra* for the simple reason that the stratum from which it comes could have been disturbed as it falls within the plough zone.

There large tracts of arable land within 1 km exploitation territory from the ancient site and the total area available for agriculture is approximately 2.20 sq. km (250 ha) and around 2.5 km radius is 15.50 sq. km (1550 ha). The available agricultural land was more than sufficient for the incipient agriculture practiced by the Savalda people (Pappu and Shinde 1990). In the area between 1 and 5 km radius there are tracts of arable and pasture land. There are patches of deep black soils on the left bank near the village Chhadwel, where a small settlement of the same period was located earlier. This was identified as a farmstead and might have served as an annexe to the main site (Shinde 1985). There are a few isolated hills in this zone, which are located northwest, southwest and south of the ancient site. Near the foot of northwest hills was located a small settlement, which was thought to be occupied seasonally to pasture their flocks (Shinde 1990 a). The survey also revealed the presence of large number of lumps of Chalcedony stone, which is available in the form of veins in the vescular basalt around that site. However, the lithic blade industry is conspicuously absent at Kaothe. The exploitation territory at present is not thickly forested. But it is quite likely that it had a cover of thick scrub type vegetation, which must have provided some seasonal wild plant and animal foods.

In view of the occurrence of a large quantity of faunal remains comprising of 38 different species of ani-

mals, which include mammals, birds, reptiles, fish and molluscs, there is a possibility of the Kaothe people depending heavily on animal food rather than agricultural products for their subsistence. The faunal remains excavated from three different localities (KTE-I, II and III) were studies separately (Thomas and joglekar 1990). The abundance of bones domesticated animals in the central locality (KTE-II), is not without significance and suggests intense human activities. The ratio between domesticated and wild mammals varies considerably in these localities. The central part (KTE-II) has the minimum of wild animals (21.98%) compared with the peripheral localities (KTE-I and III). KTE-I has yielded 27.94% of wild animals whereas it is 50% KTE-III (Thomas and Joglekar 1990).

The high percentage of cattle bones in the faunal assemblages shows the significant role it played in the diet of the Kaothe people. The age of the animals at death has been estimated. In layer (1) a large number of cattle been killed around the age of 3 years, whereas in layer (2) they were killed when quite old. The breed of cattle identified at Kaothe has no parallel in the Deccan Chalcolithic sites. This is a typical breed which more similar to the "Kankrej" variety of Gujarat. Buffalo also appears to have played important role in their diet. The other important domesticated animal in their food economy was sheep and goats, who were killed in large numbers in layer (2). Probably the number of goats was more at the site as the ratio of sheep and goats killed is 1:4. Domestic pig bones are very few in numbers and it is difficult to surmise whether the inhabitants had any stock of domesticated pigs (Thomas and Joglekar 1990).

At least 16 species of wild mammals have been identified at Kaothe and probably 13 of them contributed to their food economy. The bones of sambar, Nilgai, wild Boar, Chital, Blackbuck, Fourhorned Antelope, Bear and Langur have been identified of which the last two may not have played any role in their diet. In addition, the inhatants also exploited other natural resources like birds, reptiles, fish, crab and molluscs to supplement their food economy. Four species of birds, two of reptiles and eight species of molluscs have been identifed.

The site catchment analysis carried out has enabled us to speculate that most of the requirements of raw materials were met from within the catchment area. Basalt exposures noticed along the river banks, which shows both vertical and horizontal joint pattern, could have served as the main source of raw material to prepare different objects such saddle-querns, hammer stones, rubber stones, etc. Fine quality clay, the main raw material required for pottery production, occurs in the cliff sections exposed on both banks. The source of chalcedony, the chief raw material used to fashion lithic tools, occurs within the catchment area, but it seems that it was not exploited by the Kaothe people. A few objects made on such materials as conch shell and carnelian, the semi-precious stone, which are not available locally could have been obtained from the neighbouring region of Gujarat.

Concluding Remarks

Almost all the known sites of the savalda culture, save Daimabad, are located in the Tapi basin and hence it is believed that its origin took place there (Shinde 1990a). Chronologically, the culture has been placed between c. 2200-2000 B.C. at Daimabad, where the Savalda cullture underlay the Late Harappan occupation. However, the single radiocarbon determination that we have from Kaothe excavation, i.e. 1920 ± 90 B.C., has enabled us to provide a time bracket of c. 2000-1800 B.C. But it is highly likely that the beginning of the culture goes back to the last quarter of the third millennium B.C., at least in the Tapi basin.

Kaothe, the only Savalda culture site in the Tapi basin excavated on a large sclae, has produced some new evidence in the form of their pit-dwellings, burial customs, tool assemblage and diverse painted ceramics. Besides, it has thrown appreciable light on their subsistence pattern. Blade tool industry, one of the characteristic features of the Deccan Chalcolithic is conspicuously absent at Kaothe. It is not because the suitable raw material such as chalcedony, chert agate, is not available. Kaothe II, a small satellite, located roughly 3 km to the northwest of Kaothe, is found to be very close to the source of these raw materials. A large number of tools made on long bones of a variety of animals have been collected in course of the excavation. Among the different types, point is the predominant followed by chisels, scrapers and punches.

When the site was first visited, it was thought that perhaps this was the most extensive and flourishing Chalcolithic settlement in the Deccan. However, the subsequent excavations revealed altogether a different picture. The flimsy pit-dwellings and make-shift kitchens suggest temporary nature of the settlement. The extensive area was probably brought under occupation gradually by shifting. There is some evidence to suggest that the season of occupation of the site was during or after the rainy season. The archaeozoological studies carried out revealed that a few piglets (*Sus scrofa*) were hunted when they were less than three months old. The yound ones of wild boar are generally born between May and July.

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Agricultural Remains From Madhya Pradesh (India) From Chalcoolithic Period to Mauryan Period

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The present work aims at making an analytical survey of the economic life of the people of Madhya Pradesh from chalcolithic period to 3rd Century. B.C. Besides, the study also aims at making a critical survey of economic development of the people, who have always expressed themselves only in their priceless labour through the pages of history (Nigam 1974).

Man is the product of the enviroment in which he lives. His daily life, living conditions and habits are determined largely by the geographical factors. Physical environment of a country not only provides a basis for the all round development of economic, social and other institutions, but also determines the ideas of people and moulds the entire philosophical and psychological texture of man (Mudgal, 1960).

The earliest economy of the ancient people particularly prehistoric, early, middle, upper palaeolithic and mesolithic was based on hunting and gathering economy, while protohistoric, neolithic, chalcolithic and iron age economy was based on various aspects such as:

(1) Agro-economy, (ii) Domestic economy, (iii) Metal technological economy, (iv) Industrial economy, and (v) trade and commerce.

Though above mentioned aspects are the basic factors of the economic life of the people of that time the author deals with the agro-economy only such as Agricultural remains and Agricultural implements.

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The earliest agro-economy in India has been attested by the cultivation of rice at Koldihwa and Mahagara dated 7th-6th Millennium B.C. (Sharma *et al.* 1980). the discovery of wild rice in the 9th-8th Millenium B.C. at Chopani-Mando in the advance messolithic (proto-neolithic) (Mittre 1977) has been identified as domesticated variety of *Oryza sativa.* Plentiful evidence of rice has been obtained from Koldihawa and Mahagara in the form of rice husk as well as rice grain in carbonised form.

Chang (1977) made SUMP studies of five samples of potsherds of Koldihawa and according to him, on the basis of the texture of Glum surface, it may be said thast rice found from these sherds represented the cultivated form. The cultivation of rice as a staple food is an outstanding contribution of neolithic man in India (Sharma *et al.* 1980). Rice from the neolithic chalcolithic levels is also found from several other sites in India, as from Chirand, Oriup and Baradih (Bihar), Baidipur (Orissa), Rangapur, Lothal (Gujarat) and Kalibangan and Ahar in Rajasthan (Ghosh and Chakraborty 1980).

Besides, the protohistoric people ate the wild and domesticated animal flesh. The animal bones suggest that the economy of these people was closely linked with hunting. The domestic animals included cattle, sheep, goat, swine, antelope and also aquatic creatures like fish, tortoise and birds.

The people of Malwa culture raised a large number of crops possibly in the alluvial tracts of Narmada, Chambal and their tributaries. They might have also cultivated the rich black-cotton soil for which Malwa is justly famous. These

early farming communities subsisted on farming, hunting and fishing. They reared cattle, sheep, goat, baffalo and pig which were also slaughtered for diet.

There are two basic sources of study of agro-economy from chalcolithic period to 3rd century B.C. in Madhya Pradesh: (1) Direct source-grains and seeds. (II) Indirect source-Agricultural tools and implements, employed for agriculture and food. The detailed data is given below:

(I) *Direct source-Grains and Seeds*

(A) *Cereals*: (a) *Wheat*: For the first time in Madhya Pradesh charred or carbonised grains of wheat has been recovered from all the phases of Navdatoli excavation. Wheat has two varieties as Mittre (1961) stated.

(i) Breatd wheat, the grains are short oblong grooved, and thick with their ends broad and blut, identified as Triticum vulgare compactim (different from the spelt and Emmer wheat).

(ii) Bread wheat with pointed ends comparable to spelt in shape, but their L/B and T/B ratios are different and therefore, regarded as a variety of or nearer to the wheat of first type.

The Malwa level at the Kayatha has revealed the charred wheat of Triticum sp. Linn (Kajale 1974).

Wheat was found at Dangawada in Malwa level but its species have not been identified so for (Wakankar and Khare, 1981). Jorwe phase at Inamgaon has revealed the remains of wheat which indicated that the Jorwe farmers, more particularly those at Inamgaon, could grow wheat because of adequate water supply. Water for irrigation purposes was also stored in the channel from the flood waters of the river Ghod (Davalikar 1979).

Sufficient remains of vegetarian food material in the form of carbonised seed of wheat was found at Kayatha excavation. Layer (31) deposit at Kàyatha yielded a burnt house in KTH - I where burnt wheat was found stored in a small thick red burnished storage jar. The wheat found on the ground was completely burnt and indeed a difficult task to collect the wheat for C-14 test. The age of this house has now been eatablished as 1760 B.C.

A bokhar, containing wheat, has been found in a very good condition in KTH-4. The charred wheat became powdered due to heavy pressure but sufficient quantity of the powdered wheat deposit was collected from the find spot. This clearly indicates that the Malwa people bave been cultivating wheat in this region for the last thirty eight centuries (Wakankar 1967).

(b) *Barley*: Barley was found at Navdatoli along with charred barley grains. Dangawada excavation revealed carbonized grains of barley in period I (Wakankar and Khare 1981). In Maharasthra or Deccan region, the inamgaon also reveald charred grains of barley in Malwa level and it must have been the principal cereal (Dhavalikar 1979).

Songaon, a chalcolithic site about 100 K.M. south-east of Poona, yielded the barley grains preserved in good condition and belonging to Hordeum vulagare Linn species (Kajale 1978). Sample was collected from early Jorwe culture (1200 B.C.).

Besides the Madhya Pradesh chalcolithic sites carbonised grains of barley have also been found from various Indus (Mohenjo-daro, Harappa and Kalibangan), Neolithic (Chirand), painted grey ware (Atranjikhera) and early historical (Ter, Nevasa, Noh) sites in India (Buth and Chowdhary 1972).

(c) *Rice*: The rice is one of the most popular cereals which was cultivated since the ancient times. The evidence found at Kolihawa and Mahagara goes back to 7th-6th millenium B.C. (Sharma *et al.* 1980). At Navdatoli rice was absent in phase I, but present in phase II-IV. The rice grains procured from ths site are oblong, flattened and strongly ribbed. It is identified as a variety of *Oryza sativa* L.

Burnt grains of rice were found at KTH-5 during excavation. This is the earliest evidence of rice cultivation in Malwa which was found at Kayatha. Dangawada has also revealed the grains of rice during Malwa chalcolthic (Wakankar and Khare 1981).

Besides the Madhya Pradesh chalcolithic culture sites, the grains of rice have so far been reported from Lothal, Rangpur, Chirand, Baidipur, Oriup, Ahar, Kalibangan, Inamgaon, Mahisadal, Pandu-Rajar Dhibi, Sonpur, Atranjikhera, Hastinapura, Noh, Gandhara-grave culture, Hallur sites and early historical sites like Pataliputra, Rajghat, Rajgir, Ujjain, Nagda, Ter, Pauni, Ropar, Kolhapur, Khakrakot, Rang Mahal and Nevasa. Above mentioned sites are studied by Mittre (1974). The charred grains of rice were also found from other sites such as Tripuri, Nagara and Bhokarkan and have been studied by Kajale (1974).

(B) *Legumes*

(a) *Lentil:* Lentil has been reported from all the phases of Navdatoli. The grains are thick and lenticular in shape with the keel edge preserved in some. It has been identified as lens culinaris Medikus (Lens esculenta Moench) (Sankalia 1974).

Besides Navdatoli, the lentil was found at some more sites in India like Chirand, Inamgaon, Ter and Nevasa

and also from other sites out of India like Tepe-Sabz (Sabz), Tell Ramad, Jericho, P.P.Neo, Jarmo, Aceramic Hacilar, Ceramic Hacilar,g Aceramic Ghediki and Acreamic sesklo.

(b) *Black gram (Urad)*: Black gram (Urad) was found first of all in India. The seeds are square or oblong with a pronounced concave hilum scar said to resemble the black or dark brown seeded variety identified as phaseolus mungo L. Black gram was found at Inamgaon, Nevasa and Ter (Sankalia 1974).

(c) *Green gram (Mung)*: Green gram (Mung) has been identified as Phaseolus L. and probably had its first occurrence in India. The seeds are square to roundish and smaller than those of urad; the hilum scar with a raised ridge visible in some Green gram was found at Inamgaon and Ter too (Dhavalikar 1981-83).

(d) *Grass Pea* : Grass pea seeds are very much compressed and wedge-shaped with the small hilum placed on one side of the thick end and identified as Lathyrus Stivus Linn. Seeds of four other leguminous weeds also occur: Pisum arvense L.,Lathyrus sphaericus, Retz., Vicia sativa Linn. V. tetrasperma, moench. Besides Navdatoli, the grass pea was found at Dangawada, Inamgaon, Kaundinyapur, Ter and Paunar.

(C) *Oil seeds*

(a) *Linseed*: Linseed was reported from phase I,II, and IV at Navdatoli in a pure, unmixed form. The seeds are well preserved with distinct beak at the micro-pylar end. Indentified as Linum usitatissimuin Linn, it is now extensively cultivated in India for extracting oil and not for making flax. Presumably this was also in use at Navdatoli. Besides Inamgaon, Kayatha and Dangawada have also yielded the linseed from the excavation. The food was perhaps cooked with linseed oil which was found from the chalcolithic sites of Madhya Pradesh.

(D) *Fruits*:

(a) *Ber*: The fruit stones are globose or oval in shape, and three celled, identified as Zizphus jujuba Lamk. Ber is found from the last phase of period IB at Dangawada. Besides Madhya Pradesh, the ber is reported from several other sites of India like kalibangan, Kodekal, Pataliputra, Nevasa, Ter and also from Mohenjodaro.

(b) *Amla*: Only one complete fruit stone was reported from Navdatoli and identified as Myrobalan or Phyllanthus embliia.

There is also another unidentified fruit type from Navdatoli from Kyatha (KTH-III). A broken kapith fruit, completely in charred condition was recovered. This fruit is traceble here since the beginning of the human settlement and gives a clue to its earlier name Kapitha which subsequently came to be known as Kaith and Kayatha.

The distribution and origin of the above mentioned cereals and legumes have been briefly discussed by Vishnu Mittre., Kajale and some other scholars of palaeobotany. They have pointed out that both lentil and flax were regarded as western Asiatic in origin. This has received further confirmation by the recent discoveries of wheat, lentil, peas from C.900 B.C. and flax (linseed) from about C.600 B.C. from the Anatolian Plateau, Mesopotamia and South Iran at several sites, so that one can trace the diffusion route from the west to the east, with wellmarked stages. This fact is significat when we discern Iranian or western Asiatic inspiration in pottery form and designs from several sites of Madhya Pradesh during chalcolithic time.

(II) *Indirect source-Agricultural tools and implements*

Agricultural tools and implements are mainly used for agricultural purposes and have been found from various sites. These implements may be divided into groups according to their functions:

(i) *Axes*

The early specimens of copper axes have been recovered at Kayatha. At Kayatha two copper axes were found. Of these, one is complete, though small and the other which is bigger was found broken into two frgments. This is a distinct advancement so far as the copper technology of the protohistoric period is concerned. Here it may be noted that they bear indentation marks similar to those that were found in chalcolithic copper axes from other sites (Ansari and Dhavalikar 1975).

The axes, flat and having a convex cutting edge, have been found at Navdatoli. One of them, however, is a shouldered axe. Some specimens have shallow groups of circles which were deliberately made: their significance, however, is uncertain (Sankalia *et al.* 1971).

A copper axe frome the chalcolithic level and iron axe from the early historical level have been found at Awra.

During sixth and fifth centuries B.C. the iron was used for making various implements. Iron axes have been recovered from various sites of Madhya Pradesh during the early historical periods.

The early plain axes belonging to the period c.600 B.C. to 300 B.C. are reported from Nagda and Ujjain, resembling the plain of copper found at other sites in Madhya Pradesh. Axes at Besnagar had a sharp curved blade and a thick rectangular buttend. Besides, socketed axes or axes with a hole for inserting a haft or handle indicates further stage of development in the making of this implement.

At Nagda, the only specimen of axe is represented by a socket, with a protruding end, being suggestively the base of an axe.

An iron axe has been found at Kakrahta and Sooron which belong to the Mauryan period (Sharma 1987).

(ii) *Plough shares*

The earliest evidence of ploughing has been yielded at Kalibangan in the chalcolithic levels, which is an indirect source of the ploughshares. But from the excavation plough shares have not been reported earlier to the historical period.

Ploughshare made of iron is revealed at Jaderua (c.500 B.C.)

(iii) *Spades*

It was made by beating out the metal and bending over the two sides to meet in front. It served the purpose of shovelling the earth from one place to the other. An early one occurs at Ujjain (c. 500 B.C. - 400 B.C.).

(iv) *Hoe*

The hoe made of iron was used to dig the earth. They are made thick and flat with a round projection or flange on each edge of the butt-end bent inward to form a hole for the handle.

A hoe from Nagda (c.500 B.C. - 200 B.C.) has a pointed tip with triangular section. Another of this type has been found from Jaderua (c.500 B.C. to c. 300 B.C.). Similar hoes have been reported from varous sites of Madhya Pradesh. A unique type of hoe was found at Navdatoli from period IV. It is difficult to say whether the top ring is formed by bending the flanges at the top, because it was rusted (Sankalia 1971).

These implements were put to diverse use. However they ae so thin and light and with a broad splayed edge that they seem to have been in use for light digging purpose i.e. as garden-hoe (Margabandhu 1985).

(v) *Sickles*

This is one of the most important implements used for agricultural purpose, mainly used for reaping. It indicates to the knowledge of producing cereals and food grains and a systematic agricultural economy. Sickles have been known and used during protohistoric times.

Early historic period has also revealed the existence of sickles made of iron. The early ones occur from the fifth-fourth century B.C. Megalithic sites have also reported sickles in large number.

Sickles have a semicircular curve and half of it blade lies in almost a circle around the handle to make it fuctionally more convenient. Many of them are broken but have short tangs for handle. Wood, bone and ivory were used for handle.

Crescent-shaped curved blades and a short tang is a common shape. The earliest examples are known from Nagda, Kayatha, Jaderua, Tumain and other sites. Broken pieces of a sickle handle have been found at Kayatha. A large sickle of iron is found at Jaderua (c.500 B.C.)

The sickles at Nagda can be broadly divided into two groups, namely, (1) with long curved blades, and (2) with crescent - shaped blades. All the specimens have a thin triangular cross-section, and square or rectangular for the tang and belong uniformly to period III. Similar sickles, resembling either one or the other or both the types have also been reported from many other sites.

A fragmentary sickle blade made of iron is reported at Awra. They are mostly from period III.

Another fragment of a sickle, perhaps tang, has been found at Sooron (c 500 B.C)

Besides the above mentioned, the following remains also indirectly attest the presence of agriculture during the chalcolithic and early historical times.

(i) Ring Stones.
(ii) Sling Stones,
(iii) Hammer Stones,
(iv) Hammer Stone-Anvils,
(v) Grinding Stones,
(vi) Querns,
(vii) Kitchen complèxes along with furniture,
(viii) Hearths and twin or multi hearths,
(ix) Bull and Bull forms and
(x) Dough plates.

Chalcolithic agriculture was mainly dry farming since the entire western Madhya Pradesh is a semi-arid zone with the annual rainfall ranging between 400-1000 mm and average rainfall is about 106 mm. The black cotton soil, which occupies almost entire Malwa, is known for its fertility. It is, however, much deeper in the Narmada valley. Agriculture must have been a gamble with nature during those days.

Ancient Indian civilization mostly developed in the river valleys which were well equipped with irrigation system, which helped in the growth of food, crops and cotton. This artifical irrigation facility is attested at Inamgaon in Maharashtra (Dhavalikar 1981-83) They seem to have used their scare resources, especially water, very economically and intelligently or else theyt would not have been able to raise such a large variety of crops. To add to their skill they diverted the flood waters through a channel (extent length 118m, 3.50m deep and 4m wide) and a sort of bund or an embankment was built parallel to it. Its basal courses were of stone pebble set in mud mortar and the upper portion was earthen. The channel was deep in the middle (3.50 M) and thus served also as a narrow tank for storing water which was probably used for pot irrigation. The traces of the channel suggest that the water could have been diverted to the adjoining fields by gravity flow. There may not have been

much loss of water by way of seepage as the channel has been dug into the rock bottom and its sides into the pulverised rock.

The epigraphical references indicate that Pūshyagupta and Tushāspha, the governers under the Mauryan rule, built and renovated the Sudarshana lake for irrigation purpose. This epigraphical evidence is further confirmed by the statements of Megasthanese and Kauṭilya. Another reference to the existence of canal is found from the Hathigumpha inscription of Kharavela, which mentions that nearly 300 years before a canal was built by the Nanda King of Magadha and the same canal was extended towards his capital by Kharavela.

Conclusion

The fertile plains of Madhya Pradesh provided the ground for agricultural potential. Besides, the black cotton soil and belt of rivers like the Narmada, Chambal, Betwa, Mahanadi, Tapti and their tributaries fascinated the ancient people for settlement on the banks of these rivers. The people of Malwa culture raised a large number of crops possibly in the alluvial tracts of river. They might have also cultivated the rich black-cotton for which Malwa is famous these days. These early farming communities subsisted on farming, hunting and fishing. They reared cattle, sheep, goat, buffalo and pig which were also slaugthered for diet.

The cereals and plant remains were found at Navdatoli (Vishnu Mittre 1969). Previously, Navdatoli was the only site in the Malwa region where cereals have been found. At present there are other excavated sites also which have revealed the remains of cereals, already described earlier. Thus, on the basis of the finds it can be summarised that the inhabitants cultivated several agricultural products such as wheat, gram, peas, Masur, Mung, Urad and rice (Sankalia *et al.* 1971).

Findings of two sets of twin hearths with raised wall at Eran ascribable to a late phase of the period are quite interesting. Sometimes burnt clods of clay were also crushed into the floor. the charcoal pieces found in the floor may indicate their intentional use (IAR-1962-63).

Bulls and Bull forms found from chalcolithic and early historical levels of Madhya Pradesh substantiate that bulls were used for ploughing and cultivating the fields (Wakankar 1982).

The repertoire of stone tools and equipments consisted of stone mace heads, sling stones, pounding stones and pounding hammers with bulbous ends; it is possible, however, that as the grains could not have been grinded properly in the fine flour form, the grinding of wet grains must have been practised. It is likely that some kind of baked chapatis were also used as the dough-plates of red ware, used from one side, have been found.

The pairing tools comprised microlithic blades, knives, crescents or lunates and trapezes etc. The trapezes or crescents could possible be fixed on a wooden base to provide a cutting edge like a long knife or a sickle (Banerjee 1986).

There are many chalcolithic sites excavated in Madhya Pradesh like Awra, Manoti, Pasewa, Piplya-Lorka, Atudkhas, Runija and Besnagar which have yielded several implements like pestles, querns, mullers and mortars alongwith microliths used for agriculture in many ways. The tools and implements, used during chalcolithic times, continued to be in use during the early historical times also.

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The Indus Culture Seal of There Forms And Seven Figures As Pictorial Representation of AV Hymn IV. 37

P.V. PATHAK

The Indus seal of 'There Forms and Seven Figures' found at Mohenjodro (DK 6847) can be understood as Pictorial representation of Atharva Vedic hymn IV. 37. The AV hymn IV. 37 was chanted for driving away the malevolent spirits of Gandharvas and Apsarases with the help of plant species *'Ajasṛngi'* (*Onida Pinnata*).

The first stanza refers to four of the seven sages represented by seven figures at the bottom.

The second stanza refers to the plant species Ajsṛngi *(Onida Pinnata)* by ornated goat in the left top portion.

The Central human figure is in the process of preparation of extract of these foul smelling species. A bunch of it is kept before him and right hand middle rectangular shape is a pot for extraction in water.

The fourth stanza refers to abode of these malevolent spirits being Pipal (*ficus religiosa*) represented by a jar made out of Pipal branches.

The fifth stanza refers to Gandharvas and Apsarases who dwell on these trees. the human figures suspended in jar points to these malevolent spirits.

The reference to genital organs in seventh stanza is represented by symbols on the seal.

Next 5 stanzas can not be suitably correlated as script inscriptions are effeced beyond recognition.

Four seals of the 'Three Forms' type are discussed in the article.

The Indus seals and the Indus script have not yet been satisfactorily deciphered. Several attempts at explaining the Indus seals and copper tablets and significance of the pictorial representations have acceptance. The different approaches towards deciphering. Indus script are summarised by Zvelebil (Zvelebil 1985: 151-187). It is to be noted that while correlating the Indus seals with the Vedic lore, most of the researchers have referred to some ṛcas from the Ṛgveda However author's survey of the Atharva vedic lore has proved to be more rewarding. He has earlier interpreted the famous Pasupati seals and 'The Man and the tiger seals' based on the AV hymns II. 34 and IV. 3 respectively (Pathak 1989 a and b). He had illustrated significance of some of the Indus symbols inscribed on these seals. In this paper I have attempted to interprete 'The Three Forms and Seven Figure Seal' and other seals.

2. *Seal Descriptions*

2.1 There are four seals of the type 'Three Forms and Seven Figures' from Mohenjodaro and Harappa. They are

1. There Forms and Seven Figures Mackay PL.XCIX
2. There Forms and Six Figures M 442 p 109
3. There Forms and Pestle and mortar on a prismic seal. M 488 p 119
4. Three Forms only. M 177 p 209

Reference numbers and pages are as per Parpola (1987).

In all the above seals the three forms, namely the ornated goat, human figure in squatted postion and 2 human figure enclosed in a container are common. The other details vary. In all there are four seals indentified depicting the similar legend which is main theme of the AV hymn IV.37.

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2.2 The Three Forms and Seven Figure Seal

Among the four seals this is most clear and well preserved seal. However its left top corner is effaced and some script symbols are obliterated beyond recognition.

The Three forms and Seven Figure seal was excavated at Mohenjodaro (DK area No. 6847) and is rectangualr in shape. As the seal title indicates there are seven standing human figures at the bottom half of the seal. All these human figures have their facial portions more elongated than normal. They appear to possess long beards. All these figures are wearing long garments extending to their knees. All of them are having long plaits with a round shape at the end of their plaits, as if circular rings are tied to their plaits. They are all wearing long headgears.

There is a human figure in half squating postion at the centre of the seal. It too has long headgear with trident at the top. Its plait is shown to be thicker. It looks as if he is performing ritual looking at the human figure enclosed in a jar like shape. both of its, hands are stretched forwards as if pleading to the human figure in front. There is stick like appearance on the left knee. In front of the central human figure there is another human figure with long thick plait and trident headgear enclosed in a jarlike shape made out of Pipal tree branches. The tree species clearly indentified from shapes of the leaves. The tree branches extend upwards from the oblong shaped base.

Above the first human figure from right in the bottom, there is a rectangular shaped figure divided in two compartments. The right hand side compartment being larger in size compared to that on the left. There are many such terracotta rectangular shaped receptecles with two compartments from Mohenjodaro (Mackay 1938: 12,15,21,27,34). Very similar rectangular receptacle is used in the yajna. It is known as sakṣira-praṇītā-praṇayana-pātram. It is reported in a book on Yajna implements, Yajñāyudhāni (Dharmadhikari 1989:16). This too has two rectangular compartments. Its material of construction is not mentioned. But similar rectungular pot with single compartment is known as Praṇītā pātra (Dharmadhikari 1989:15). It is sometimes made out of clay and used for practising black magic.

Near The feet of the central human figure, is seen an irregular shaped figure with two clear extension. The right extension has slightly astered the headgear of the third human figure from the right. Behing the central human figure the most important figure on the seal is that of an ornated goat. Its neck and hind portions are ornated.The facial portion and eye of the goat figure is not shown normal. The species can be indentified by its horns and hoofs. It belongs to the goat species.

In the top left portion of the seal are the Indus script inscriptions only four of which can be clearly identified. The human figure in the top left corner is effaced from the waist onwards.

2.3 The seal of Three Forms and six figures

This seal is also reported from Mohenjodaro. (Joshi and Parpola 1987:109) It is very similar to earlier seal. However there are a few variations the first and foremost being the standing Human figures drawn in top half of the six seals. Their appearace is similar to the earlier seal figures. The half sqatting human figure is in the left bottom corner. The follows the ornated goat figure and in the right bottom corner is the human figure. Its portion above waist is removed by the hole punched in the seal. There is another hole between the first and second human figure in the top half. It is engrved on both the the sides of the seal.

The engraving is not very clear. However the figures can be easily indentified.

2.4 Three Forms and pestle and Mortar on a prismic seal

This triangular prism shaped seal has legend on all the three sides of it. The seal impressions on a cast (Joshi and Parpola 1987:119) bring out the legend clearly. On one side of a prism. There is elephant at the left end followed by left handed *Swastika* sign enclosed in a rectangle. Other two figures are not legible. The second face too is not very clear. Excepting a quadruped animal in the right no other pictures are clear. At the left end there appears to be Indus sign of gridiron. The third face has four pictures. As we go from right to left the picture sequence is, human figure enclosed in a jar like shape of Pipal leaves, the ornated goat looking at the human figure and half squatting human figure has the distinct trident shaped headgear. It is urging the human figure in pipal leaf jar. The last figure is rectangualr shaped with a knob like extension arising out of the top side. The author prefers to call it as pestle and mortar for the reasons outlined later. The extreme left corner figure is visible but not clearly understood.

2.5 Three Forms Only Seal

This seal is reported from Harappa (Joshi and Parporea 1987: 209) It is a rectangular seal with Indus script inscriptions on one side and three forms on the adverse side. The inscriptions are not very legible. However the pictures can be seen. The three forms are inscribed as earlier. In the right corner is human figure enclosed in inverted jar like shape, followed by human figure in half squatting position and the last figure being that of a goat whose horns are very clearly seen. They are like the goat in the first seal described.

There are some variations in the forms of this seal. The first human figure does not show typical headgear. The pipal leaves can be clearly marked however they form arch like shape enclosing the human figure inside. The headgear of the squatting human figure too does not carry trident. The goat too does not look ornated.

2.6 Distinct fealures of the seals

Although there are few variations, there are some distinct features of all these four seals. These being

a) The three forms namely; the human figure enclosed in pipal leaf jar, half squatting human figure and the goat are common.

b) The leaves of the plant species covering the human figures are that of pipal only.

c) While the human figure enclosed in pipal branches is always in the right hand other two namely the goat and the squatting human figure human figure are looking at it.

d) The goat is ornated in all the first three seals while in the fourth seal one can say that decoration of the goat is effeced.

e) Pipal jar like shapes enclosing human figure are common in the first three seals; it is enclosing arch of inverted jar like shape again of the pipal leaves in the fourth seal.

f) While there are seven standing human figures in the lower half of the first seal, the human figures in the upper half are six in the second seal.

g) The pictures engraved on both the faces of the second sea are indentical but are legible on one face.

h) The second seal has two holes and one hole has obliterated human figure of the right end. This seal has no script inscriptions.

3. *Interpretation of the Seals*

The seals have attracted attention of may scholars. Three of them are quoted below. The first seal i.e.'Three forms and seven figures' being very clear it is mostly discussed by them in details.

According to Mackay (1938:337-338) the seal represents the tree goddess in a pipal tree and seven ministrants or deities of the lesser mark. He does not think of goat in the left top corner being a sacrifical animal. Therefore the seal does not represent sacrifical ritual.

Buddha Prakash (1966:32-36) has discussed the first two seals. He quotes ṛc from the Ṛgveda, RV I. 164.1 and thinks that the seal represents the theme of the ṛc. It is representation of the creation proccess of the universe. The *Aja* (goat) on the seal is unmanifested Brahman. It is siezed by cravings to assume for-presented by five constituents of matter, mind and life. The bottom seven figures represent seven eternal forms. The engraver has rendered the idea of the ṛṣi Dīrghatamas into visible forms.

According to Asko Parpola (1985:120-21) the head in the central portion represents head of an animal offering to the goddess of victory inhabiting the sacred fig tree. Animal to the left is wild markhor goat (sanskrit *śarabha)* as a victim that pleases the goddess as much as buffalo. Bottom seven figures are seven mothers representing the stars of pleiades or kṛttikās.

3.1 The common points that image from the views of these scholors are summarised below:

a) The prominant animal figure in the left corner of the seal is a type of goat.

b) The seven bottom figures have certain significance i.e. they could be seven seers or seven mothers which are traditionally accepted.

c) Origin of the pictorial representation of the seal is rooted in the Indian mythological tradition and not outside.

4. *AV IV - 37 and The Seal Deciphenment*

The seals of three forms are pictorial representations and according to the author they present central theme of the hym AV IV.37. The hymn IV.37 has twelve ṛcs or stanzas. Out of these, 7ṛcs are seen to be depicted on the first and second seal, while two others represent only the central theme. The last four stanzas of the hymn cannot be deciphered on account of the Indus signs being effaced from the first seal.

The seer of the hymn AV IV.37 is Bādarāyaṇih and the presiding deities being *Ajasṛngī* and *Apsarasḥ*. *Ajasṛngī* (*Onida Pinnata*) was a herb used for driving away evil spirits i.e. Gandharvas and their consorts Apsarases.

Text of AV and Sāyaṇa's commentary on AV by Visvabandhu (1960) and English translation by Whitney (1905) are referred below. The following sections deal with the text of the AV hymn, translations by whitney and discussions about interrelation of the figures on the seals with the hymn stanzas.

4.1 tvayā p"ūrvamatharvāṇo jaghn"u raksāns yosadhe tvayā jaghānakaśyasas tvayā kaṇva Agastyaḥ

Tr: By thee of old the Atharvans slew the demons; O herb; by thee did Kaśyapa slay, by the kaṇva, Agastya. ----1.

Accordingd to Sāyaṇācārya the ṛc refers to the plant species Sahamānā. It is not mentioned in the ṛc. Sāyaṇa relies on the traditional information passed on to him.

This ṛc refers to seers, namely, Atharvan, kaśyapa, Kanva and Agastya. Indian mythology accepts

seven seers as chief amongst the ancient seers. RV X. 130.7 refers to seven seers. At times their names differ. Although only four of them are mentioned, all the seven are implied and are engraved on the first seal. The authour (Pathak 1989 b) has shown that the long plaits need not necessarily mean that these figures with long plaits are female figures. On the contrary longer faces appear to be long beards of these seers which is general impression about ṛṣ is in the Indian mind. Thus they represent seven seers i.e. male figures.

Out of these seven seers six are twins and seventh is born by himself (RV I. 164.15). Viśvāmitra is the seventh who is God born (*devaja*), RV III. 53.9. the six figures in the top half of the second seal appear to point to the tradition of six, twin born seers.

The seals third and fourth do not represent these seers.

4.2 twayā vayamapsaraso gandharvāncatāyāmahe.
ajasṛnyṅyaja raksah sarvām gandhena nāsaya

Tr: By thee do we expel AV IV (*cat*) the Apsarases, the Gandharvas; O goat horned one, drive the demon, make it disappear by (thy) smell.----------2.

'Goat horned one' in above ṛc refers to Ajasṛngi(*Onida Pinnata*). It is a very foul smelling plant. Sāyaṇa points out (ṛc-6) that the plant bears fruits with horn like appearance.

It is used for driving out the evil spirits by its foul and offensive smell (Sarvān rakṣaḥ pisācādīn tvadīyena ugrena gandhena nāsaya adarsanam prāpaya)

The ornated goat on the seals with prominent horns represents the plant species Ajasṛngi. Goats too possess very foul and obnoxious body smell. The goat figure therefore is pictorial representation of the plant Ajasṛingi.

4.3 nadīm yantvapsaras opām tāramavasvasam
gulgul"uḥ pīlā naladyau3kṣagandhi pramardinī
AV IV. 37-3

Tr: Let the Apsarases go to the stream, to the loud down bowing of waters:

Gulgul"u, pīlā, naladī, Āukṣagandhi, pramardinī; so goaway ye Apsarases, ye have been recognised-----3.

There are few more plant species with fragrance mentioned in this ṛc. These too were used for driving out the evil spirits.

It is possible to visualise the mode of use of these plant species. To extract the foul smell from these species the easiest approach being pulping and mixing these with water. On thorough mixing with water the foul smell is extracted in water.This extract can be used for spraying in the areas infested with evil spirits.

The central human figure sitting in half squatting position appears to have kept the plant sepecies in front of him. the two horns of Ajasrngi fruits are clearly seen in the figure. The pestle is placed near the knee ot this figure. On pulping and mixing with water it was to be stored in a rectangual bicompartmental receptacle shown in the extreme right. Number or such bicomparmental vessels have been found at Mohenjodaro. The pulping of the plant species is given credence in the third prismic seal where in the left corner is engraved shape like. This is typical common pestle-mortar combination found in Indian house-holds. A pestle has usually knob like shape at he holding end which is shown in the above figure.

The central human figure is shown to be performing the ritual of preparing the spraying mix. He is male; for such rites were performed by male. He in the top right corner is urging the evil spirit to go away. He is as if saying to evil spirit that it has been recognised.

4.4 yatrasvatthā nyagrodhā mahāvṛkṣāḥ sikhandinaḥ
tatparetāpsarasaḥ pratibuddhā abh"utana
AV IV. 37-4

Tr: Where (are) the asvatthas; nyagrodhas, the great trees,with crest, thither go away, ye Apsarases, ye have been recognised.------4.

It is to be noted here that in the Vedic period, the Gandharvas and their consorts Apsarases were considered to be fierce and harmful entities and malevolent spirits. Their abodes were big trees like fig, banyan etc. Sāyaṇa points out asvatthādīnām tadāvāsaḥ (Tai.Sam. III. 4.8.4) It is depicted pictorially by human figure enclosed in jar like shape of Pipal branches. The Pipal leaves are clearly seen on the seal, Gandharva is shown by human figure in the jar with trident headgear and long plait. The central human figure is obviously urging him to go back to his abode i.e. the tree, for the evil Gandharva is recognised.

4.5 Yatra vaḥ preṇakhā haritā arjunā uta yatrāghtāṭ.ḥ karkaryaḥ samvadanti
tatparetāpsarasaḥ pratibuddhā abh"utana
II AV IV 39.5

Tr: Where (are) your swings green with whitish, where cymbals (and) lutes sound together-thither go away; ye Apsarases, ye have been recognised.----5.

In the vedic times Gandharvas and Apsarases were known to be dancing and singing spirits. They lured away human beings to be killed and eaten.

4.6 Eyamagannosadhīnām vīr"udhām viryāsvatī
ajasṛngyasrāṭakī tīkṣṇasṛngī vyrsṣatu

Tr: Hither hathcome this mighty one (vīryavanta) of the herb, of plants, let the goat horned arātakī sharp horned push out.---- 6.

In the commentary of this ṛc sāyaṇa has stated that the plant Ajasṛngi has fruits of the horn like appearance (sṛngākṛtī phale yasyāḥ sā). Arāṭki points to Ajasṛngi.

4.6 ānṛtyataḥ śikhandino gandharvas yāpsarāpataḥ
bhinadmi muskāvapi yāmi śepaḥ AV IV 37.7

Tr: Of the hither dancing, crested Gandharvas, Apasaras lord, I split the testicles, I bind fast the member.--7.

The Gandharva figure is aptly shown with trident headgear as described in the rç i.e crested (Sikhanḍinaḥ).

This rc also refers to binding of the testicles of lthe Gandharva. This binding or procreative organ is reresneted by the symbols of and . These symbols appear on the famous Pasupati seal also. The hymn AV IV.3 too refers to the procreative power of Pasupati. Thus both these symbols common to both these seals represent male procreative organs.

There are five more rçs i.e. total 12 rçs of the hymn text and translation is given at the end of the papaer. As other symbols on the first seal excepting the fish sign are not clearly visible, while symbols on the obverse side of fourth seal effaced beyond recognition, it is not possible to correlate the other rç descriptions with these symbols.

5. *Conclusions*

There are four seals from the Indus culture depicting the same theme. The three forms and seven figures and others with just three forms can be interpreted based on the hymn AV IV.37.

The There forms, namely Gandharve enclosed in Pipal jar, the ritual performer and ornated goat represent the central theme of the hymn.

It appears that Atharvavedic lore can throw more light on the Indus culture.

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AV IV.34. 8-12

Text and Translation by Whitney

Bhīmā indrasya hetayaḥ satamṛṣ ṭīrayasmayīḥ
tābhirha viradān gandharvānavakādān vyṛSṣatu. AV IV 34.8

Tr: Terrible are Indra's missiles (*heti*), a hundred spears of iron, with them let him push out the oblation eating, avaka eating Gandharvas.

Avakā (blyxa octandra) a grass like march plant.

bhīmā indraṣya hetayaḥ satamṛṣti hiraṇyayīḥ
tābhirhavirandān gandharvānavakādān vyṛSṣatu. AV IV 39.9.

Tr: Terrible are Indra's missiles, a hundred spears of gold with them let him push out the oblation eating avaka eating Gandharvas.

avakādānabhis ocānapsu jyotaya mākakān
piśācān sarvānoṣadhe pra mṛgīhi sahasvaca. AV IV 34.10

Tr. Avaka-eating ones, scorching, making light in the waters - all the piśacās, o herb do their sldughter and overpower.

svevaikaḥ Kapirivaikaḥ Kumāraḥ sarva Keśakaḥ
priyo daś eva bh"utvā gandharvaḥ sacate
striyas tamito nāśayāmasi bramhaṇā vīryāSvatā. AV LD. 37.11

Tr: one as it were a dog, one as it were an appe, a boy all hairy - having become as its were dear to see the Gandharva fastens upon (*sac*) women ; him we make disappear from here by (our) mighty (vīryavanta) in cantation (brāhmaṇa)

jāyā id vo apsaraso gandharvāḥ patayo y"uyam
apa dhāvatā martyā martyān mā sacadhvam. AV IV 34.12

Tr: Your wives, verily, are the Apsareses; O Gandharvas, ye are (their) husbands, run away, O immortal ones, fasten not on mortals.

Development of Sculptural and Terracotta Art in India From the Beginning to the Mauryan Age

R.C. SHARMA

The rendering of art in one way or other seems to have originated in India. The cave dweller in the pre-historic times kept himself busy, after fulfilling his physical needs,in giving vent to his feelings of fear and joy in drawing the immediate surroundings of his shelter. The three dimensional form to the outbursts of his creative sensibility took a big span of time until he was able to make use of fire to give lasting effect to the mud specimens of the introduction of tools for imparting the desired shape. The unbaked clay or some other soft gift of nature preceded this process of evolution in the early pre-historic age but these could not withstand the passage of time due to their fragile and perishable nature. The hypothesis is based on the occurrence of earthen bricks used for fortification walls and mud plastering in the pre-Indus site like Kalibangan. At the same time the terracottas of good quality have come from Mehargarh the period of which dates back to the 4th millennium B.C. The excations of this site have opened a new horizon in establishing a cultural sequence of the Sub-continent.

The centuries preceding the Indus culture seem to have witnessed the stage of transition when the raw mud or sun burnt bricks were used for architectural purpose and fire was simultaneously commissioned in service for strengthening. These include female figures, toycart, wheel, bull, bangle and basin with incised decorative motifs. The femal figures or mother goddesses from Mehargarh are particularly noteworthy for their bodily treatment, wig type hairdo and expressive form. These finds, particularly the first three viz. cart, bull and wheel may suggest a changing social order when the pastoral trend was inclined towards the agricultural pattern.

We then come across the next stage in the historical sequence in the Indus Valley culture dominating in the vast region in Pakistan and India. This highly developed urban culture has left several indelible imprints. It is quite surprising that in the third millennium B.C. the art of sculpture in stone, bronze and terracotta was at the advanced stage. The bust of the so-called priest wearing a scarf with tre-foil motifs and fillet fastened round the head is a fine illustration. The half armless torso in red stone bespeaks a high degree of workmanship as indicated from its muscular anatomy. Its straight and stiff posture and skyclad body have led some scholars to conjecture it as a Tirthaṅkara figure. The grey lime stone male figure with some outstretched position of broken arms and legs may perhaps represent a dancer.

Amongst the bronze items the outstanding piece is the dancing girl wearing a large number of bangles on the left arm while the right arm makes a triangle opening on the hip. The rhythmic treatment of body is quite befitting a lady dancer. A few animal figures like buffalo although somewhat crudely fabricated do reflect the vigour of the beast.

While the stone and bronze sculptures aree scanty in number, the terracottas have been recoverd in abundance from differnt sites of Indus and later period sites. These remains continue to be the base material for reconstruction of India's cultural history. Earth, creativity of potter and artistic urge of the users were the major factors behind popularity and continuity of terracotta

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items. After removing all impurities of clay the figure was shaped by hands in early periods then by wheel or mould later. At the stage of leather hard drying, shaving, smothing, stamping, decorating and impressing were effected before fixing as per requirement. The products were then put in fire either in open pit or a kiln. Since early proto-historic period the terracotta objects seem to bear a coat of slip, wash or paint which served as preservator also. It has been conjectured that while the figures were shaped by men, colour was applied by the woman folk.

What these tiny earthen items aimed at, remains rather obscure or controversial. Conjecturally, this art purported to create devotional objects or votive offerings, magical items, gamesman, souvenires and architectural members. This was also commissioned for documentation, eduction,royal command, seals, block printing, moulding, weights, numismatic moulds, crucibles, flooring, lamps, models of houses etc. The terracttas also furnish valuable data for reconstruction of early history and grasp the moods, modes and minds of the age.

Malleability, easy availability, and inexpensive nature of clay were responsible for making the terracotta art more celebrated than any other medium of expression in early India. Its ductile and soft nature gives ample scope for innumerable shapes, rich variety and forms.

The cultural relevance of terracottas is of great merit. The Indus sequence is preceded by Zhob and Kulli sites in Baluchistan. But while the former represents a primitive phase the latter reflects a careful handling with a touch of sophistication. The former may be the exponent of peasant culture and latter indicates a well settled refined urban civilization. The divine mother aspect dominated in the Indus terracottas and continued for long . Abundance of bull may be taken as respect of Indus people for this useful animal. The depiction is however, rare. It may be presumed that the Indus and the Vedic people had different philosophy so far as their bias for domesticated animals is concerned. In Vedic period we have the practice of bull sacrifice (*Vṛishotsarga*) but the cow was considered to be *Aghanya* (not to be killed). In Mesopotamia also this animal was respected as Mother goddess, fruitful and Lady of Gods but the same was forgotten by the Indus people as they must have been much impressed with the utility of the bull. The excavations at Surkotda in the Kutch region have yielded only minor terracotta objects like bangles, cakes, balls, weithts etc. but the figures are wanting. On the other hand Daimabad earns credit presentting some of the most interesting solid copper figures of elephant, rhino, buffalo and cart driven by man.

A few Indus figurines do bear some alien features. This fact suggests that the prosperous Indus traders were trading with foreign lands. We also notice the hairdo with coiled plait which was a fashion in Babylonia.

Disappearance of the Indus cultre remains a mystery and their Vedic successors have not unfortunately left the material remains to enable us to assess them properly. The most plausible reason being that leading a pastoral life and subsequently switching over to agriculture they depended more on forestry and timber which being of perishable nature could not withstand the climatic adversities.

The rich Vedic literature handed down to us through oral or audio traditions does shed some light on the formation of symbols and some icons. Indra commands over Viśvakarmā who creates forms and Tvashṭā who is resposible for giving different shapes. The terms used are 'Puru r"upa' and 'R"Upa piṃśan'cutting and chiselling. Viśvakarmā acts as Karmakāra (smith) who remains busy with his furnace in the process of smelting and forging - *Samdhamana*. Śilpa was the common word for craftsmanship and the finer work was known by 'Suśilpa'. The fabricator or maker was therefore addressed as 'Suśilpa'. The fabricator or maker was therefore addressed as '*Sur"upa-kritnu*' and the goddess of beauty was known as Sri. The beautification was called as *Supratika*.

The basic difference in arhitecture of Indus and Vedas is that the former was more utilitarian and devoid of beautification but the latter laid emphasis on decoration. The Vedic house Sākā was compared with bride and female elephant and a richly decorated house looked like a goddess. We do come across a large number of symbols and auspicious motifs in the Vedic literature which represent divinity, animals, birds, even fabulous figures, trees, flowers and general artistic expression. Some of these are of great metaphysical nature conveying deep philosophy of life.

The large castle of Indian art during the last about five thousand years stands on the foundation of Vedic symbols which subsequently manifested and were transliterated in various shapes and forms in sculptural art of India. Some of these symbols were transformed into the human forms giving rise to the icons of different pantheons. When the Vedic reference records 'Even the mighty gods are said to be produced by the smelting of their substance through fire in the furance, the hymn may be explained that invocation of fire results in pleasing even the great gods as the deities appeared throuh the *Yajnas* only. On the other hand this may also be interpreted that the figures even of big dimension were produced through melting of metal in fire. Śatapatha Brāhmaṇa records the use of Ayasth"ṇa (wooden pillar covered by copper sheet) by the householder (*Gṛihapati*) of Kāmayakavana.

The post Vedic period has a big span of about more than one thousand years before we start getting the

antiquarian remains ascribable to a definite style. Thus from about 1500 B.C. to the 5th century B.C. we have together details from the literature like upanishad, Sūtra, Pāṇini etc. The great Epics, the Rāmāyaṇa and Mahābhārata are stocked with innumerable references with regard to early art traditions but their historicity and composition have been debatable due to inter-polations. The description of Lanka and Particularly of the Pushpaka Vimāna of Rāvaṇa in the Rāmāyaṇa and the Assembly Hall (*Sabhā*) of Yudhishṭhira in the Mahābhārata have valuable accounts of arts, crafts, decorative motifs and interior decoration. Similarly, the use of an image of Bhīma to be installed before Dhirtarāshṭra proves prevalence of images.

The most significant development of this age is the introduction of icon but nothing can be said concclusively about its impact on the Indian social order. The sculptures and terracotta items from the excavated sites are very few. Ofcourse, the clay figures from Inamgaon and Nevasā in Mahārāshṭra and one from Pāndụ Rajar Dhībī in West Bengal assigned to about 1200 B.C. deserve our attention.

Similarly, the discovery of large stone box from a *stūpa* at Piprāwā on the India-nepal border in the last century was an epoch making event. This big monolithic coffer with a lid contained several items of great artistic merit. These are now preserved in the Indian Museum, Calcutta. One is the soap stone relic casket shaped like a *st"upa* itself and bearing a Brāhmī inscription of the 4th century B.C. characters. It informs that the casket was made for depositing the relic bones of the Buddha. The other is the crystal casket with fish shaped ornamental lid and a gold leaf inside the lid. The other objects include a female dancer on gold plaque, a deity on gold plaque, a coil of fine silver wire, *Svastika* stamped on the gold leaf, taurine symbol stamped again on the gold leaf, bird in red carnelian, elephant on gold leaf etc. Recent excavations in the area have also revealed some rare items.

The ring stones dsicovered at different places (Mathurā, Kauśāmbī, Rājghat, Vaiśālī, Sankisā, Patnā and Taxila) are of great signficane to glimpse the pre-Mauryan sculptural art. These circular small objects with or without a central hole are carved with human figures (mother goddesses), animals like elephant, bull, deer, crocodile, lizard, floral motifs, lotus, creepers and geometrical patterns. The motifs represented are Śrīvatsa, muchukunda (honey suckle), Tāla (palm tree), taurine etc. This should be pointed out here that India was the part of the common Orient and art trends travelled to far distance and were exchanged between the neighbouring countries.

The Mauryan age has to be divided into two phases for the purpose of survey of artistic trends. The first is the pre-Aśokan and the second being the Aśokan art. Before Aśoka the timber continued to be the chief medium for the art and architecture hence the evidence is scanty. The remains of Kumrāhār near Patna suggest that the royal palace of Chandragupta Maurya was constrcurted on wooden pilars which were gilded with metal sheet embossed with gold and silver motifs. The artistic rendering must have been of high degree as it was admired by the Greek writers as well.

We must pass on to the reign of Aśoka who was a great king, thinker, philosopher. builder and patron of art. He gave a new dimension entirely not only to the kingship but also to the sculptural art which is known as the court art flourishing directly under the patronage of the Emperor. This is characterised by lofty inscribed columns surmounted either by the *Dharmachakra* or an animal. Lustrous polish is another striking feature. These pillars were put up at different places to disseminate the message of compassion, piety, non-violence and goodwill and also the royal command. The best of them is the Sārnāth Lion Pillar whose crowning *Dharmachakra* was damaged and broken in pieces.

The pillar has four components i.e. the long shaft in a single stone block with plain and smooth surface round in section but tapering upwards, the capital part of which was joined with the shaft by a heavy copper bolt and shaped like bell with inverted lotus, abacus (pedestal for the crowning animal) which was square earlier and circular later and the top crowned with an animal. The columns were made of stone from the quaries of Chunar hill and were produced there in the centre founded specially for the purpose. It has been suggested that the idea of putting up such columns was an imported one and so was the process of their manufacturing. The sudden transformation of the folk or tribal type sculptural tradition to the imperial grandeur was the result of India's contact with Iran where similar art traditions were already deep rooted under the mighty Achaemenian emperors. The naturalism and vigour of the animal bespeak a perfection achieved by the sculptor in anatomical details. On the other hand there are several features which suggest a developed indigenous treatment. The very idea of columns, animals, *Dharmachakra*, inverted lotus petals etc. are to be explained in the Indian context. The underlying message and the purpose were also indigenous. At the same time the commissioning of the services of some skilled sculptors from Iran for helping in fabricating such monumental pillars may also not be ruled out.

The folk or peoples' art in the Aśokan period is represented by the Yaksha statues. Heavy, large size or human size statues were installed as guardian deities on a platform outside the village. These were found at Parkham (Mathurā), Baroda (Mathurā), Noh (Bharatpur), Besnagar (Bhopal), Pawāyā (Gwalior), Dīdārganj (Patna), Rājghat (Varanasi), Sopara (Gujarat), Shishupalgarh (Orissa) and Amīn (Kurukshetra). Two new Yaksha statues

resembling the one from Parakham have recently seen their way to the Mathura from Bharna Kalan.

Most of these Yaksha statues should belong between Mauryan to the Sunga period. The epigraph on the pedestal of the Parkham statue, however, supplies an information of vital value. Accordingly, the sculptural art was practised in teacher and taught tradition i.e. *Guruśishya Paramparā* as this status was made by Gomitaka who was the disciple of Kuṇika. The same is the case with a Yakshī statue from Naglā Jhīngā the iscription of which records the name of the sculptor as Nāka and his teacher as Kuṇka. Even if these statues are stylistically somewhat postdated the tradition of carving has to be reasonably antedated. The Yaksha images became the prototypes for subsequent icons of different sects.

The terracotta art of this age followed the normal course of evolution. The pre-Mauryan trend of archaic mother goddesses now became refined with the introduction of clear human face, elaborate hairdo with several floral motifs, prominent breasts and exaggerated hips. The technical advancement was the beginning of the mould to press out only face to be fixed on the hand modelled body. The applique treatment for fixing breasts and ornaments continued. The female figures or the mother goddesses dominate but from now we do get some male and animal objects also. Foreign impact on the terracotta art of this age is occasionally noticed. The dating of the Mauryan terracotta figurines has been largely confirmend by some recent excavations.

Arambha: a Vākāṭaka Site in Vidarbha

AMARENDRA NATH

Arambha is a village in taluk Samudrapur, District Wardha (Maharashtra). It lies 72 km south- west of Nagpur of which the first 64 km upto Jamb can be covered by the National Highway No.7 while the remaining 8 km drive is approached by a State Highway leading to Warora, a taluk headquarter of District Chandrapur. The nearest railhead is at Hinganghat on the Wardha-Chandrapur section of Central Railway. Hinganghat also connects Arambha with regular State transport services, twice a day, one in the morning and other evening. Other local bus services of Arambha can also be availed either at Jamb or Warora.

The ancient site at Arambha (20°34' N Lat. and 78°59' E Long.) is situated on the right flood plain of river Pothra, a tributary of the Wunna which, in its turn, forms into a cohesive unit virtually buried under the present day habitation. It rises over 3m from the surrounding plains and the maximum length of the mound is 300m (north-south) and the breadth is 250m (east-west). the mound forms a natural slope towards south-east, and along its periphery a couple of monsoon run-off flow from a higher plain of north-western side of village which ultimately joins the mid-stream of Pothra. A close techno-typological study of microlithic surface collection revealed the artefacts to be a transitional assemblage. In fact their degree of patination tentatively suggests a Mesolitic affiliation transitionally moving into Chalcolithic matrix.

The purpose of taking a trial dig at the site had two main objectives, besides fixing the chronology. In a protohistoric context the objective was to correlate the painted pottery of Arambha with the one noted at other sites in Vidarbha such as Adam (21°00',79°27'), District Nagpur (Nath 1991), Kaundinyapur (22°55', 78°05'), District Amaravati (Dikshit 1968), Paunar (20°47', 78°41'), District Wardha (Deo & Dhavalikar 1968), Mahurjhari (21°14', 79°30') (Deo 1973), Naikunda (21°20',79°10') (Deo & Jamkhedkar 1982), Tharsa (21°13', 79°25') (*IAR* 1985-86) and Shirkanda (21° 17', 79°31',) (Nath 1991) all in District Nagpur. The other objective in the historical perspective was to associate the site with ancient Ārammi referred to in some of the Vākāṭaka Copper Plates (Mirashi 1963). In The trial dig natural soil noticed in the form of black cotton soil was reached at a depth of 2.45m below the present surface. The entire occupational deposits at Arambha were represented by eight layers of which layers (8) to (6) belonged to Period I, Layer (5) to Period II, Layer (4) to Period III, Layer (3) to Period IV and Layers (2) and (1) to Period V. All the five periods were characterised by their typical ceramic types, however the yield of other household items remained handful.

Period I had 65cm deposit in thickness and was essentially brown in colour wth patches of black cotton soil. The cultural components were less in quantity as a major portion of the layer was disturbed due to later pit activity, at the same time the remaining undisturbed portion to the layer could not be excavated in order to preserve the U-shaped hearth of this period.

The hearth had an opening (25cm wide) towards north. the side walls on an average were 13cm in thickness while its back was 20cm thick. The available height of the wall noted in the section was 15cm. Its chamber contained ash, charcoal bits and potsherds. It appears that the hearth was used for cooking purpose. Traces of charred grains were noticed around the hearth but samples, could not be preserved.

The deposit was characterised by the typical painted pottery tradition of protohistoric Vidarbha. As far as the ceramic industries are concerned no distinguishing feature could be noticed to classify the pottery types of Chalcolithic and Iron Age. This overlap was also noticed at other excavated sites of Vidarbha. In fact at Adam, the Chalcolithic assemblage could be separated from that of the Iron Age deposit on the basis of occurrence of copper.

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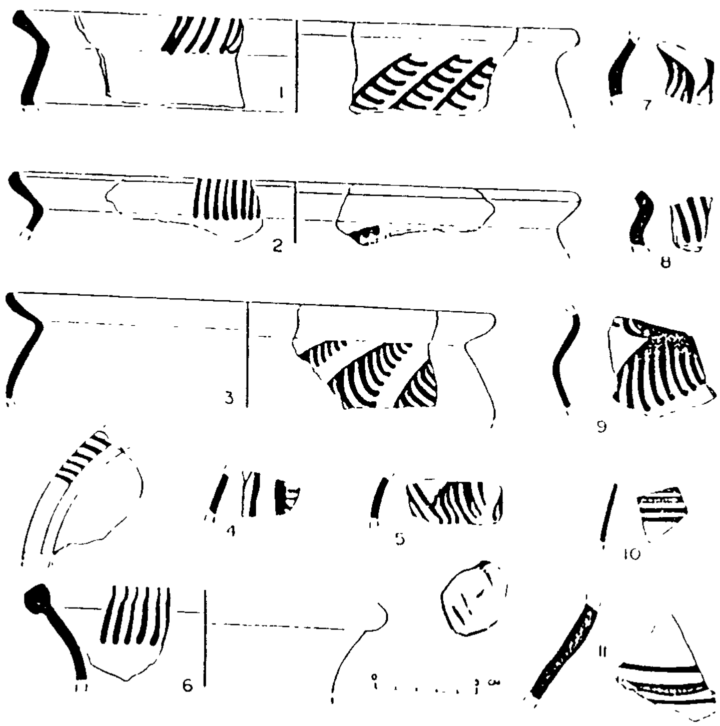


Fig. 1

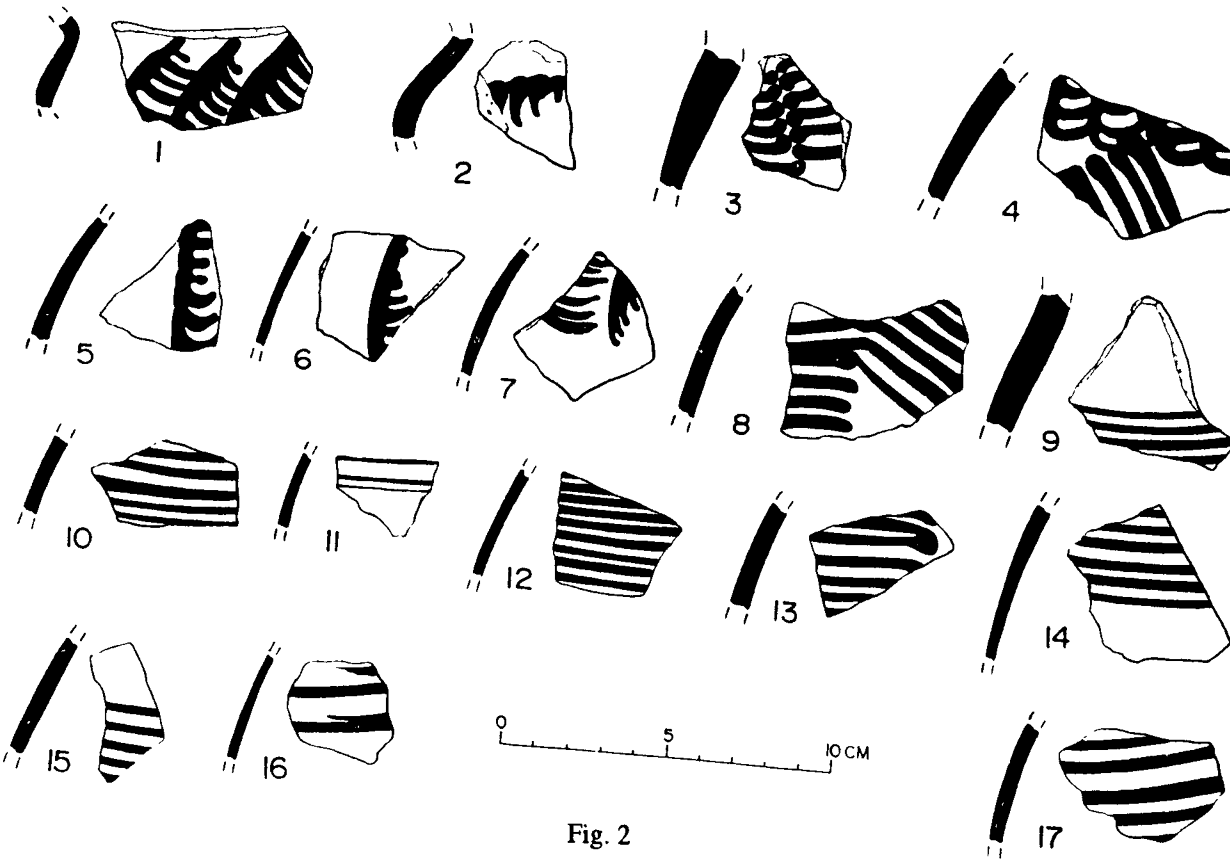


Fig. 2

microliths, bone artefacts and polished celt in the deposit preceeded by iron.

Besides the plain pottery types, the diagnostic painted pottery types of the period were (i) Black-on-Red Ware (Fig.1),(ii) black painted Black-and-Red Ware (Fig.2) and (iii) white painted Black-and-Red Ware. The paintings on them were confined to rim and shoulder portions of vase and carinated *handi* which included variants of comb and palm leaves patterns and vartical strokes.

Other than a stone hopscotch,nothing was fouund from this horizon to throw light on the various aspects of protohistoric Vidarbha.

Period II, on an average 30cm inthickness, was composed of brown earth mixed with charcoal bits and bones. It had patches of floors prepared out of stone chips, dust andmud. The typical Black-and-Red ware bowls and dishes generally associated with the Northern Black Polished ware started occuring in this period. Incidently, a tiny NBP sherd of a bowl was also reported. Other important antiquities of the period included a shell bangle fragment, crystal bead, whet stone andfragment of iron rod.

Period III, on an average 35cm in thickness, was composed of dark to pale brown soil. It yielded red ware sherds, some had typical decorative designs of Sātavāhana times. The surface colour of the sherds varied from dull red to bright red. The shapes met with were vase, bowl, basin and lid-cum-bowl. A platter reported from this horizon was comparable to the one found at Prakash (Thapar 1965). the decorated designs comprised of finger-tip decoration, multiple grooves, oblique notches, foliage and flowers and converging lines forming triangles (Fig.3).

The most important find assigned to this horizon was the discovery of a terracotta coin mould (Pl.VI) attributed to the Śakas. Of the mould, only the revese counterstruck portion could be located in a well preserved condition, but the devices and legend on its countersunk surfaces were feeble. On the basis of partial reading it has been attributed to Rudradāman I, son of Jayadāman of Casṭan line (Nath 1992). the other significant objects were a copper ring of spiral-shape with their ends coiled at the top, a terracotta spool-like ear-stud incised with radiating rays, a potter's wheel, possibly used as a spindle whorl, lime stone and carnelian beads and an iron ferrule.

Period IV was composed of dark brown soil, charcoal bits, bones and rolled stone fragment. It was characterised by red polished ware and the shapes met with were basin, lid-cum-bowl, bowl and vases. One of the sherds of a vase on its shoulder portion bore a fragmentary inscription. the inscriptions incised in the Gupta-Vākāṭakā characters reads from left to right *n* (*e* or *i*) *chha*.... The legend is incomplete, yet it helps in fixing the chronology of this horizon. Other important finds include semi-precious stone and terracotta beads, shell bangles and sculptured stone objects.

The head of a mother goddess carved in round on a buff sand stone is one of the finest artistic finds at Arambha (Fig.4). The treatment of facial features and coiffure are of *par excellence* degree. It has puffy nose and lips with prominent pout. The outsized eyes are wide open *ākarnānta-netrin*). the arch-like treatment of the eye brows meticulously follow the curvature of the upper eye lid. The hair, laboriously divided at the centre of the forehead, is represented by delicate lines. The braided hair deviced into two side buns has incised decoration of latticed diamond pattern, while the hair braided at the back has chevron motif. Almost identical heads of mother goddesses have been reported at Paunar and are attributed to the Vākāṭakas (Gupta 1992). Incidently, these broken heads of mother goddess stylistically compare well with the stone image of Mahiśāsuramardinī retrieved at Mandhal, now housed in the Central Museum at Nagpur. Needless to say that these objects of art were the standard bi-products of the Vākāṭaka atelier which followed a common code of art at different centres like Mandhal, Mansar, Ramtek and Paunar, which in the ultimate analsis gave rise to Vidarbha School of Vākāṭaka art.

Another carved fragment from the site depicting a foliage motif in relief on a schist is reminiscent to the one generally noticed on the door-frames of the Gupta-Vākāṭaka edifices.

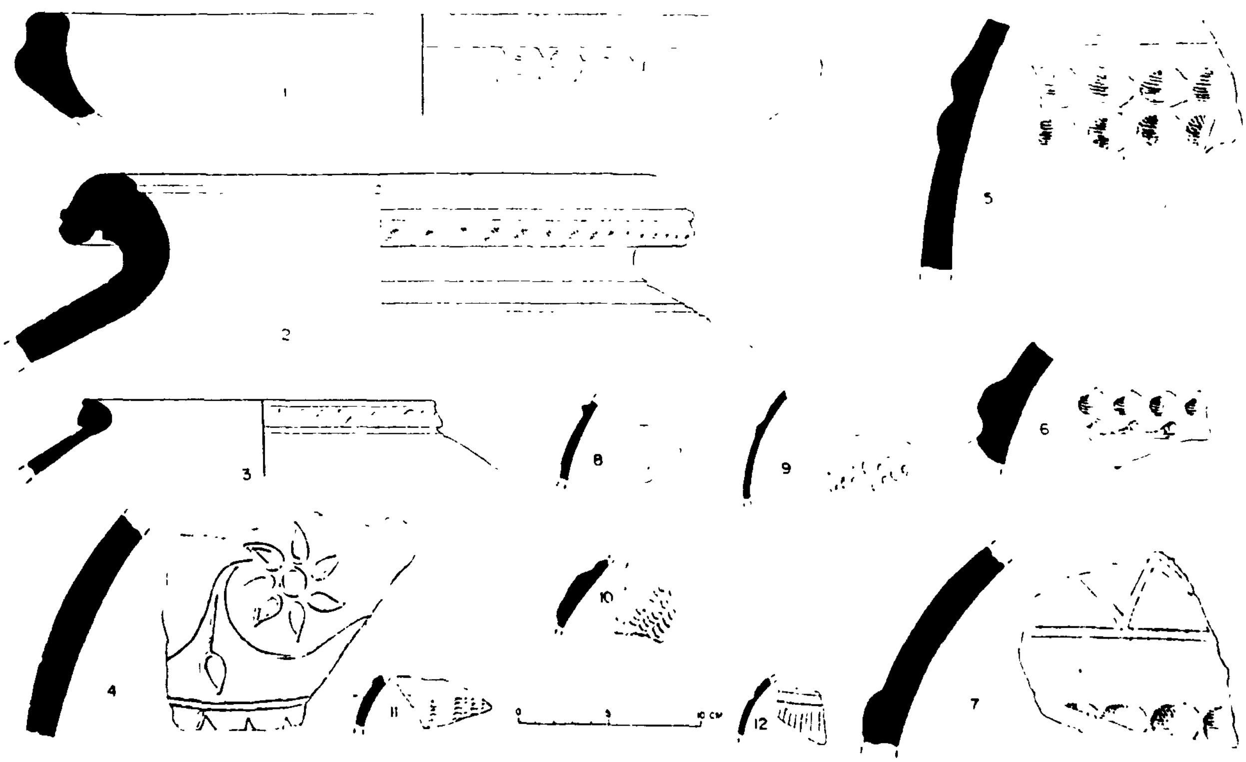
Period V composed of layers (2) and (1) introduced grey pottery types, typical to the medieval period. From this horizon glass bangles and terracotta beads were noticed.

A formal exploratory exercise at Arambha has revealed a continuous sequences of cultures dating back to the portohistoric times to medieval period.

Basing on the composition of the soil and high sub-soil water table in the region it is presumed that the nature had provided most congenial farmstead to the protohistoric settlers at the site for their subsistence.

During the early historical period the occupants had further exploited the natural resources of the region. In the process of development it seems that the site had emerged as an important centre on the inland trade route of Central Deccan. Its interaction with contemporary urban centres like Kaundinyapur, Adam and Pauni may not be ruled out. The discovery of a Northern Black Polished Ware sherd at the site serves as a pointer in this direction.

The site seems to have patronised certain handicrafts like production of shell bangles and beads of semi-precious stones and paste. The discovery of a coin mould attributed to the Śakas further enhances the importnane of the site. It is possible that the local Śaka authorities resorted to the casting of coins to overcome some monetary lapses or trade-imblances of their times.


1
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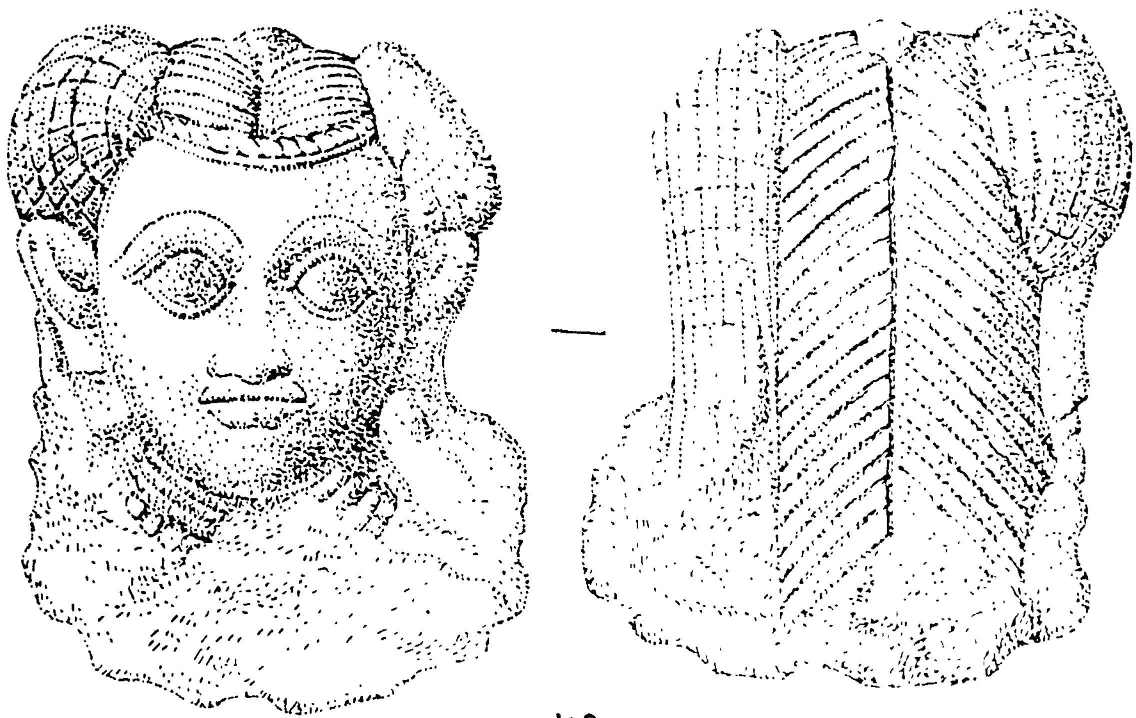


Fig. 4

The Śaka coin-moulds have been reported from other sites like Kaundinyapur (Dikshit 1968; Gupta 1986), Bhokardan (Deo 1974), Eran (Bajpai 1975) and Sanchi (Sahni 1945). the distribution of śaka coin-moulds specially in the Central Deccan is certainly significant for pecuniary reasons in historical perspective.

During the Vākāṭaka period it seems that stone carving was added to the list of local crafts at the site. As regards the indentification of Arambha with that of Ārammi occuring in the Vākāṭaka grants, it is stated that the site did not yield any direct evidence to support the above hypothesis. Yet there are some relative evidences to counter the arguments of those who try to identify the site either with present day Ārmbhi village (21°15', 78°20') in the Narkheda taluk of Nagpur District (Mahajan 1992) or Amla situated north of Multai in Madhya Pradesh (Shrimali 1987). It may not be out of places to refer that neither Arambhi village of Narkheda taluk nor Amla has yielded any archaeological relic which could be assigned to the archaeological past of early historical period.

The present site has yielded a few rich antiquities in the form of sculptural art and inscribed sherd of the Vākāṭaka era. Hence for the present, one may not have any hesitation in identifying Arambha with the ancient Ārammi for three reasons viz. (i) philology (ii) occupation of the site during the Vākāṭaka period and (iii) its location well within the core of Vākāṭaka territory. *

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Excavations at Lal Kot 1991-92 and Further Explorations in Delhi

B.R. MANI

Recent archaeological investigations attest to early inhabitaiton of Delhi in the lower palaeolithic age and human activities are noticed in the following middle palaeolithic, upper palaeolithic, chalcolithic and early iron ages with the beginning of the historical period. It is quite clear that the ridges of the sloping Aravalis which end at river Yamuna with tributaries and drains and undulating land surface had contained such a flora and fauna that the area remained ideal for hunters and food gatherers of prehistoric age followed by regular settlements scattered in different parts of the area in protohistoric times. The discovery of over three dozen prehistoric sites (Chakrabarti and Lahiri 1987; Sharma and Ota 1991) throughout Delhi and adjoining parts of Haryana and mostly confined to the bordering hilly area containing villages and places like Kalkaji, J.N.U. Campus, Lado Sarai, Chhatarpur, Anangpur, Surajkund and many sites in between and around Surajkund - Gurgaon stretch and different ridges around water reservoir of Surajkund, Anangpur dam, Badkhal lake - Sohna road, prove that the southern hilly area of Delhi bordering Haryana was environmentally better suited to prehistoric man. A large number of late Acheulian and middle palaeolithic tools were also collected by the author from Anangpur area which was excavated in the summer of 1991 by A.K. Sharma (1991: 74), the area towards its north in the west, north and north-east Delhi and further beyond which was suited for farming and land and river trade, still have protohistoric and early historical remains which were either explored or revisited by the author duing last three years.

History has witnessed Delhi as the capital-city of many kingdoms and empires. The foundation of the city of Indraprastha during the period of Mahābhārata war is well known. Successive waves of incursions from the west and iternecine war rummaged and caused the gravity of power and urban conglomorate of Delhi shift toward resttlement on several occasions to cope with the unpredictable vicissitudes of the time and intentions of the rulers for making the city protected, resourceful and majestic.

The legends known from local traditions connecting the name of Delhi with kings Dalip (Dilīpa of Epics) or Delu, king of Kanauj (Stephen 1876:11) do not contain any fact and it seems more possible that Indraprastha of the early historical period lost its grandeur some time around the Gupta period. Although the excavations of Purana Qila, the site of Indraprastha prove the continued habitation till the Mughal period, it is quite possible that Indraprastha lost its status much before the time of Anang pal II, the Tomar ruler who is credited to have inhabited Delhi sometime between 1052 and 1060 A.D. (Cunningham 1871: 151) when it came into exitstence around the Lal Kot near Mehrauli. Among the epigraphical evidences, the Palam Baoli Inscription of the time of Balban dated in the year 1274 A.D. (V.S.1333) categorically says "The land of Hariyānaka was first enjoyed by the Tomaras and then by the Chauhans. It is now ruled by the Śaka Kings" (Prasad 1990: 3-15). A list of all the rulers of slave dynasty upto Balban follows who are all called śaka rulers. The name of the city is given as Ḍhillīpura and the alternative name of the city is given as Yoganīpura (Yoginīpura). It seems that the area of Lal Kot and surrounding city became known as Ḍhillī or Dhillikā after it was founded by the Tomaras. The evidences of 8th-9th century sculptures, inscriptions - including Iron Pillar Inscription and architectural fragments from Qutb Archaeological Area suggest that during the Gupta-Post Gupta and Pratihāra periods the area comprised of a temple complex and was called yoginīpura and only later it became famous as Ḍhillī or Ḍhillikā.

Archaeological Survey of India, Delhi Circle, New Delhi.

Similar description as given above is also found in the Sarban Stone Inscrition (Eggeling 1892:93-95; Vogel 1907-08:10-11; Prasad 1990:27-31) of 1327 A.D. (V.S. 1384) of the time of Muhammad Tughlaq which was found at village Sarban which was located about 5 miles south of the city of Delhi, a hundred years ago at the place known by the same name in the area of Raisina. It differentiates between Ḍhillikā and Indraprastha. The former has been called a city of the region of Hariyānā-

"Deśosti Hariyānākhyaḥ prithivyāṁ swarggasaṁnibhahḌhillikākhyā purī tatra Tomarairasti nirmitā".

And the latter, i.e. Indraprastha, as a pratigana (paragana or sub-division) of which saravala (Saravana or Sarban) was a village-

"Indraprastha pratigaṇe grāme Sārvaletratu..."

Thus Ḍhillī or Ḍhillikā was nearly 10 kms. away from the earlier day Indraprastha which was reduced to the status of a pratigaṇa and later a village. It is perhaps because of this reason as also believed by Carr Stephen (1876:10-11) that Al-Biruni or Utbi do not mention the city of Delhi although they had knowledge of all other towns and cities of the nearby area.

The early history of Delhi is shrouded in mystery. It seems that the people or place known as Bodh or Bodhi, which finds mention in the *Mahābhārata* (VI.10.37.38;8.39) and *Mahābhāṣya* (II.4.48) of Patañjali (Bajpai *et al.* 1967:74) was one of the *nigamas* of Indraprastha and was regarded as a celebrated pilgrim centre. The same seems to be Nigambodh of the present, located on the right bank of Yamuna near Red Fort. The discovery of Asoka's Minor Rock Edict (Joshi and Pande 1967: 96-98) near East of Kailash in New Delhi provides evidence of early historical activities in the area.

A number of scientific clearance works have been done in Delhi, particularly at important monuments besides regular excavation such as at Adilabad (Waddington 1946), Lal Kot (IAR 1957-58, 58-59, 60-61) and Purana Qila (IAR 1969-70, 70-71, 71-72, 72-73). While the earlier two excavtions were confined to a limited area with limited scope, the last excavation was a major project as its land area was traditionally known and formed the most important part of the city of Indraprastha where Humayun and Sher Shah had constructed various buildings and citadel of the Dinpanah city of Delhi in the 16th century. The trial digging here in 1954-55 had revealed the occurrence of Painted Grey Ware in the lower levels (IAR 1954-55:13-14; Sharma 1990:8). Although during the excavations conducted by the Archaeological Survey of India from 1969 to 1973 a continuously rich occupation from Maurya to Śunga, Kushan, Gupta, Post-Gupta, Rajput, Delhi Sultanate upto the Mughal period was revealed at the site but no separate horizon of Painted Grey Ware culture could be traced while the PGW sherds were found in accumulations of later date. The occurrence of late Harappan pottery and Painted Grey Ware at Mandoli and at Dhansa including late and degenerate Siswal Ware Culture and PGW at Khera Kalan (IAR 1968-69) and Badli ki Sarai (Suraj Bhan 1975: 126) and the discovery of late Harappan and Painted Grey Ware site of Kharkhari Nahar inspired the author to survey different parts of the city to have a general view of the nature of early settlements in Delhi where ancient sites are vanishing slowly and gradually. Delhi has still about 1000 existing late medieval mounments and a number of contemporary sites attached with some of them or lying separately. The history and archaeology has sufficient data of the later date and hence exploratory survey was more dedicated towards findings of the lesser known periods of the history of the city.

Excavations at Lal Kot and Anang Tal (Lat.28^0 31' 40"N, Long. 77^0 11' E)

Lal Kot is the earliest known fort in Delhi which is supposed to have been constructed in the middle of the 11th century A.D. by Anang Pal II, the Tomar ruler of Delhi. Its lofty walls, massive bastions and gateways are mostly damaged and sporadically covered with debris. The circumference of the ramparts is nearly 3.6 km. with varying thickness ranging between 3 to 9 metres. The total area of the fort is 7,63,875 square metres. It is presumed that Anang Pal II peopled Delhi and constructed the Lal Kot between 1052 and 1060 A.D. Cunningham (1871:151) has quoted the short inscription on Mehrauli iron pillar - *"Saṁvat Dihalī 1109 Aṅg (Ananga) Pāl Bahi"* which corresponds to A.D. 1052 and also confirms the same on the basis of two manuscripts obtained from Garhwal and Kumaon regions which state that on the 10th day of Margaśirsha in Samvat 1117 (or A.D. 1060) Anang Pal built the fort of Delhi and called it Lal Kot. Amir Khusrau also mentions the palace of Anang Pal (Cunningham 1871:144) and the *Ain-i-Akbari* and a few other works are specific about the residence of Qutbuddin Aibak and Iltutmish in the fort of Rai Pithora which is none other than the Lal Kot. This area was thoroughly surveyed by the author with the team of the Delhi circle of the Archaeological Survey of India in 1991 (Mani 1991:147-50).

It has been said that water for making mortar for the construction of Alai Minar was brought in the time of Alauddin Khalji (1296 to 1316 A.D.) from adjoining Anang Tal (Cunningham 1871:152). Kushak Firozi, Kushak Sabj and Chabutra Nasira were the palace sites of Mamluk Sultans of Delhi in the old city of Lal Kot and on the basis of Ibn Batuta it can be said that in the year 1205 A.D. Qutbuddin Aibak built a palace in the fort which was known as Kasr Safed or White Palace (Stephen 1876: 37-39). Kasr Safed, which was also occupied later by Iltutmish, Nasiruddin Mahmud Shah, Balban and others and where many Sultans were enthroned and which

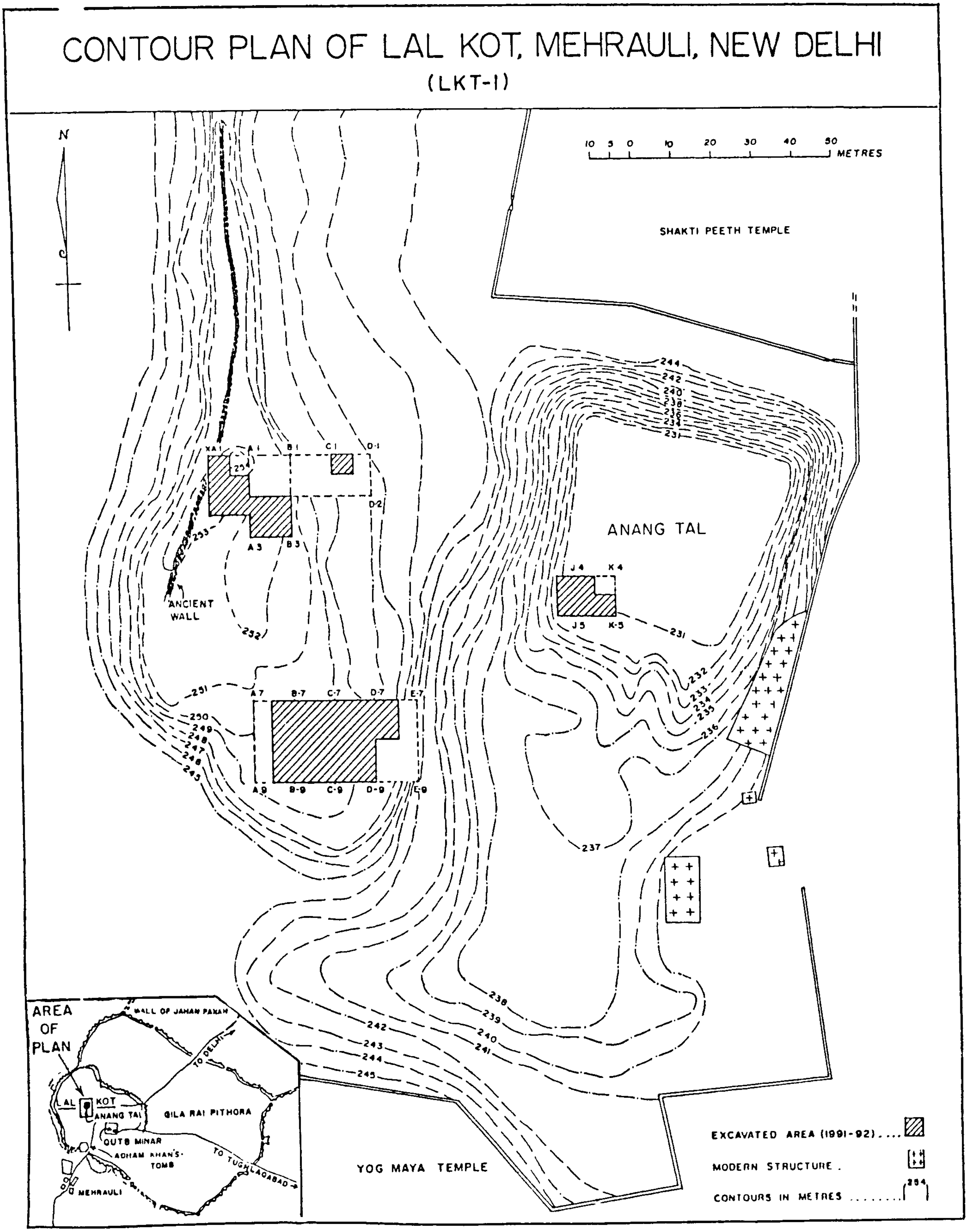

CONTOUR PLAN OF LAL KOT, MEHRAULI, NEW DELHI
(LKT-1)
N
METRES
SHAKTI PEETH TEMPLE
ANANG TAL
ANCIENT WALL
YOG MAYA TEMPLE
AREA OF PLAN
WALL OF JAHAN PANAH
TO DELHI
LAL KOT
ANANG TAL
QILA RAI PITHORA
QUTB MINAR
ADHAM KHAN'S TOMB
TO TUGHLAQABAD
MEHRAULI
EXCAVATED AREA (1991-92)
MODERN STRUCTURE
CONTOURS IN METRES

Fig. 1

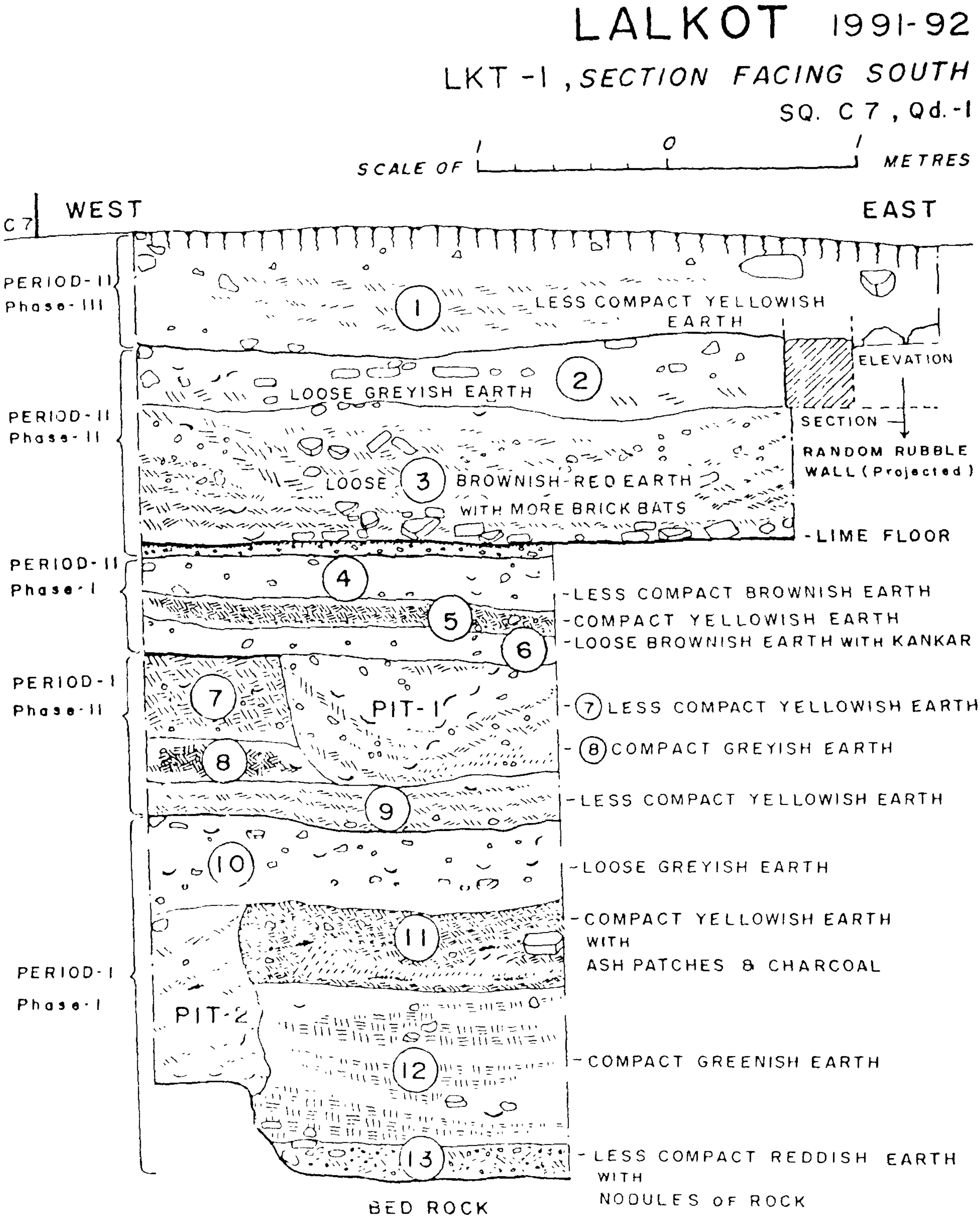

LALKOT 1991-92
LKT -1 , SECTION FACING SOUTH
SQ. C 7 , Qd.-1
SCALE OF 1 0 1 METRES
C 7
WEST
EAST
PERIOD-II Phase-III
PERIOD-II Phase-II
PERIOD-II Phase-I
PERIOD-I Phase-II
PERIOD-I Phase-I
1 LESS COMPACT YELLOWISH EARTH
2 LOOSE GREYISH EARTH
ELEVATION
SECTION
RANDOM RUBBLE WALL (Projected)
LOOSE 3 BROWNISH-RED EARTH WITH MORE BRICK BATS
-LIME FLOOR
4
5
6
-LESS COMPACT BROWNISH EARTH
-COMPACT YELLOWISH EARTH
-LOOSE BROWNISH EARTH WITH KANKAR
7
8
PIT-1
-7 LESS COMPACT YELLOWISH EARTH
-8 COMPACT GREYISH EARTH
9
-LESS COMPACT YELLOWISH EARTH
10
-LOOSE GREYISH EARTH
11
-COMPACT YELLOWISH EARTH WITH ASH PATCHES & CHARCOAL
PIT-2
12
-COMPACT GREENISH EARTH
13
-LESS COMPACT REDDISH EARTH WITH NODULES OF ROCK
BED ROCK

Fig 2

witnessed great pomp, ceremonies, contumacous brawls and bloodshed, was used as royal prison in later times. It is not unlikely that after providing extra defences to the fortification Qutbuddin Aibak altered the old palace of Anang Pal II or erected Kasr Safed in close proximity to it (Mani 1991:149). The earlier excavations conducted by Y.D. Sharma from 1957 to 1961 at Lal Kot were mainly confined to the fortification walls, although a few structures showing housing activity had also been encountered.

The Lal Kot Excavations were taken up in February 1992 under the direction of the author assisted by Urmila Sant, A.K. Khanna, Vishnu Kant, M.K.Batra, D.K. Bhardwaj, S.K. Dikshit, R.B. Chhetri, R.K. Sachdeva, G. Nageshwar Rao, Jagdish Chander, L.S. Mamani and V.P. Verma of the Archaeological Survey of India with the view to locate the citadel area and to study the layout and settlement pattern of the palaces and other allied structures of the citadel and to confirm the literary evidences about the location and shifting of the royal seat in Delhi. Another objective was to confirm the structural conception of the huge depression on the eastern side of the mound, known as Anang Tal.The citadel area must have been at a distnace from the temple - mosque complex, preferably at higher level of strategic importance with better water facility. Such suitable spot of the citadel in the fort of Lal Kot could be searched only at the massive main mound having large structural complex of rubble stones abutting the Anang Tal on its western side.

The main mound at the citadel site of Lal Kot was named as LKT-1 where excavation trenches in form of 10 x 10 m. squares divided by quadrants were laid and excavations were done in 40 quardrants of 16 squares (Fig.1). Maximum height of the mound is about 8 metres near peg A1 of LKT-1(254 metres above sea level). The maximum length of the mound is about 200 metres in north-south orientation. The measurements of the adjoining Anang Tal given by Cunningham are 159 feet long from north to South and 152 feet broad from east to west with a depth of 40 feet (Cunningham 1871: 152). During the excavations it was noticed that debris of the adjoining damaged structures have fallen from all the sides in the tank and hence it is not possible to take accurate measurements of the tank unless the structures are properly exposed. Roughly the dimensions of the inner area of the tank are about 50 x 50 metres in north - south and east - west orientations. The depth of the tank is about 14 metres from the adjoining ground level (the bottom level being 231 metres above sea level). Because of the close proximity and the probable association of the Anang Tal with the mound the area was covered under LKT-1 and accordingly trenches were laid out in grid fashion.

A preliminary study of the excavated remains revealed a sequence of two cultural periods:

Period I - Rajput Period (middle of the 11th century to the end of the 12th century A.D.).

Period II-Sultanate Period (end of the 12th century to the middle of the 14th century A.D.).

During this field-season, due to massive structural activities of the Sultanate period (pl. VII) a limited area, restricted in one part of quadrant No.1 of square C7 was excavated deep upto the natural rock wherein 13 layers were encountered upto a depth of about 5 metres (Fig.2). Of the Rajput period, no structure could be encountered in the area of C7 under excavation. The study of pottery provisonally suggests two phases of the Rajput period. The Phase I of Rajput period is represented by plain red ware also with red slip, decorated red ware with painted design black in colour, incised designs and occasionally stamped designs. Amongst these the vases are decorated with incised horizontal bands, wavy lines and a line of notched triangles on the shoulder. Some pots are decorated with black painted zig-zag lines on the top or side of the rim of vases, small basins and lids and criss-cross pattern and horizontal bands on the shoulder of the vases. Mention may be made of a single potsherd from layer 12 with inscribed Brāhmī letters of Gupta period (around 400 A.D.) mentioning perhaps a name *'v(ī)ras(o)ma' (Pl. VIII)*. Only on the basis of a single sherd it is not possible at present to suggest a separate horizon of Gupta period. Future excavations are likely to concentrate more on the earlier levels to have a clear picture of the antiquity and chronology of the site.

The phase II of Rajput period is characterised by the occasional appearance of plain glazed ware of ordinary terracotta core, black-slipped grey ware with asscoiated red ware. Small spouted vases occasionally double-mouthed, sharp edged medium sized bowls, cooking handi with ledged shoulder and mild carination, inverted flat terminal top lid, small to large sized basins, miniature bowls and vases are the characteristic shapes of the Period I.

A conical hollow knobbed lid and ring base were introduced in the second phase. The presence of glazed ware of ordinary core indicated that this phase was much closer to the Muslim invasion of Delhi as during the Muslim period its use was plentiful. Other finds of this period include: (i) a copper ring; (ii) two terracotta beads; (iii) a lipped earthen lamp; (iv) red ware circular discs or hop-scotches and (v) some fragments of legs of terracotta figurines.

The pre-Muslim association of this cultural period is evidenced by a number of scattered or reused architectural and sculptural fragments in the following period. Among them mention may be made of a stone Varāha figure (Pl. IX), two stone āmalakas, decorated pillar bases and a number of other decorated architectural fragments reused in later structures or scattered on the

mound or in the tank area of Anang Tal alongwith a huge part of another āmalaka and pillar bases found in the eastern part of the tank. The incised mason marks and the Nāgarī letters on dressed and semi-dressed stone blocks discovered during excavation in the south-western part of the Anang Tal are also evidences of Period (Pl. X)

The Sultanate Period (Period II) is represented by four structural phases. Phase I is characterised by small lime plastered water tanks of brick masonary of which the western one has a small circular hole, provided in the southern wall at the bottom, a lime floor and a magnificent circular, eight lotus petal designed water cistern with brick masonry and lime plaster and 1.40m in diametre and .72 m deep, ornamented with two series of circular drains around it. The top level of the cistern synthetised with the lime plaster floor with some sort of canopy improvised, as evidenced by the two stone pillar-bases of Rajput period set in the floor in one alignment and the two other pillar-bases may be traced after removal of the adjoining western baulk. It seems that the inlet of the cistern comes from north and joins it in the eastern side through another drain. In this phase the drains were probably open and water fell into the cistern through each petal of the lotus shape. The same drains were covered by stone chips and plastered over in the succeeding phases, i.e. Phase II. The cistern was also used in phase II. The Phase II is characterised by massive house complex of medium sized rubble masonary, lime floors, paved stone floor, lime plasters occasionally decorated. Noteworthy is exposed part of the complex having two rooms of size 6.70 mx 480m and 9.60 mx 3m attached with a verandah of size 6.70 mx 3.90m in the east and attached with 1.10 m wide staircases in the north to lead upwards. The opening of this complex is in the 2m wide gallery on its eastern side with other openings of structures of the succeeding phase (Fig.3). Notable feature of this phase was the occasional reuse of architectural and sculptural fragments of Rajput period. Amongst such remains the small stone sculpture of Varāha of 10th - 11th century A.D. and *āmalaka* of some temple are remarkable.

The Phase III is represented by a degenerated form of the earlier phase and is characterised by hearth, ovens, large sized storage jars buried into the floors and a thick random rubble wall running north to south which fortified the mound (LKT-1) in the western side. The residents of this phase mostly reused the structures of the former phase. They occasionally added brick masonary walls in the former structures.

The Phase IV is limited only in a small area at the top of the mound (LKT-1) and is charactrised by the random rubble walls running west to east and turning towards north. On the basis of numismatic and other evidences, it seems that the first two phases of Period II represent the age of Mamluk and early Khalji Sultans (13th century A.D.) when the royal seat was located in the Lal Kot. The latter two phases represent late Khalji and Tughlaq periods (first half of the 14th century A.D.) when the capital was shifted to Siri or Tughlaqabad and the site was perhaps occupied by common folk.

The significant feature of the Sultanate period was the use of plain and painted glazed ware, both of sandy - friable with whitish gritty core as well as ordinary terracotta core with associated red ware, black-slipped grey ware and thick grey ware. The underglaze decorations are patterns painted with brushes mostly in brown or black picked out with blue or greenish blue. Most of the sherds are painted with one colour-green, blue, greenish blue, pink or brown. The important shapes of the glazed ware are shallow dishes and bowls with ring base, decorated with floral and geometrical painted designs. A medium size vase with elongated body and of ordinary glazed red ware is remarkable. Chinese celadon is represented by a few sherds from the upper layers and its indigenous variety seems to have become very popular having sandy friable brownish white core and greenish surface. Two sherds of Painted Grey Ware of Protohistoric origin were also found in two different pits of layer-2 in Quadrant No.1 of C 1 and Quadrant No.1 of C7 which suggest the location of such a protohistoric site in the vicinity (Pl. IX). Among other finds mention may be made of : (i) 31 copper coins of Horseman and Bull type and coins of Muhammad Ghori, Iltutmish, Razia Sultana (?), Kaikubad, Jalaluddin Khalji, Alauddin Khalji, Ghayasuddin Tughlaq and other Tughlaq coins without names.

(ii) Fragments of inscribed Persian glazed tile with Arabic legends.

(iii) A large number of crude handmade terracotta human (Pl. XI) and animal figurines (Pl. XII). The human figurines invariably represent bearded soldiers, categorised under Rajput period levels at Purana Qila, but found in large numbers from Sultanate period levels in the present excavations. Among animal figurines horse is the most common.

(iv) Beads of semi-precious stones, glass and terracotta.

(v) Fragments of a large number of thin green-glass vessels and bottles probably with concave base.

(vi) Glass bangles.

(vii) Ivory ring.

(ix) Terracotta lipped lamps and *dīpa-stambha.*

(x) Terracotta glazed tiles.

(xi) Ear-cleaner of copper, incense burner of copper or brass, decorated door nails of iron and other metallic objects.

Another notable feature of this period was the use in plenty of circular discs or gamesmen looking like hopscotches made out of glazed ware mostly with gritty core. the Chinese porcelain pottery is totally absent at the site which alongwith other evidences suggests that after

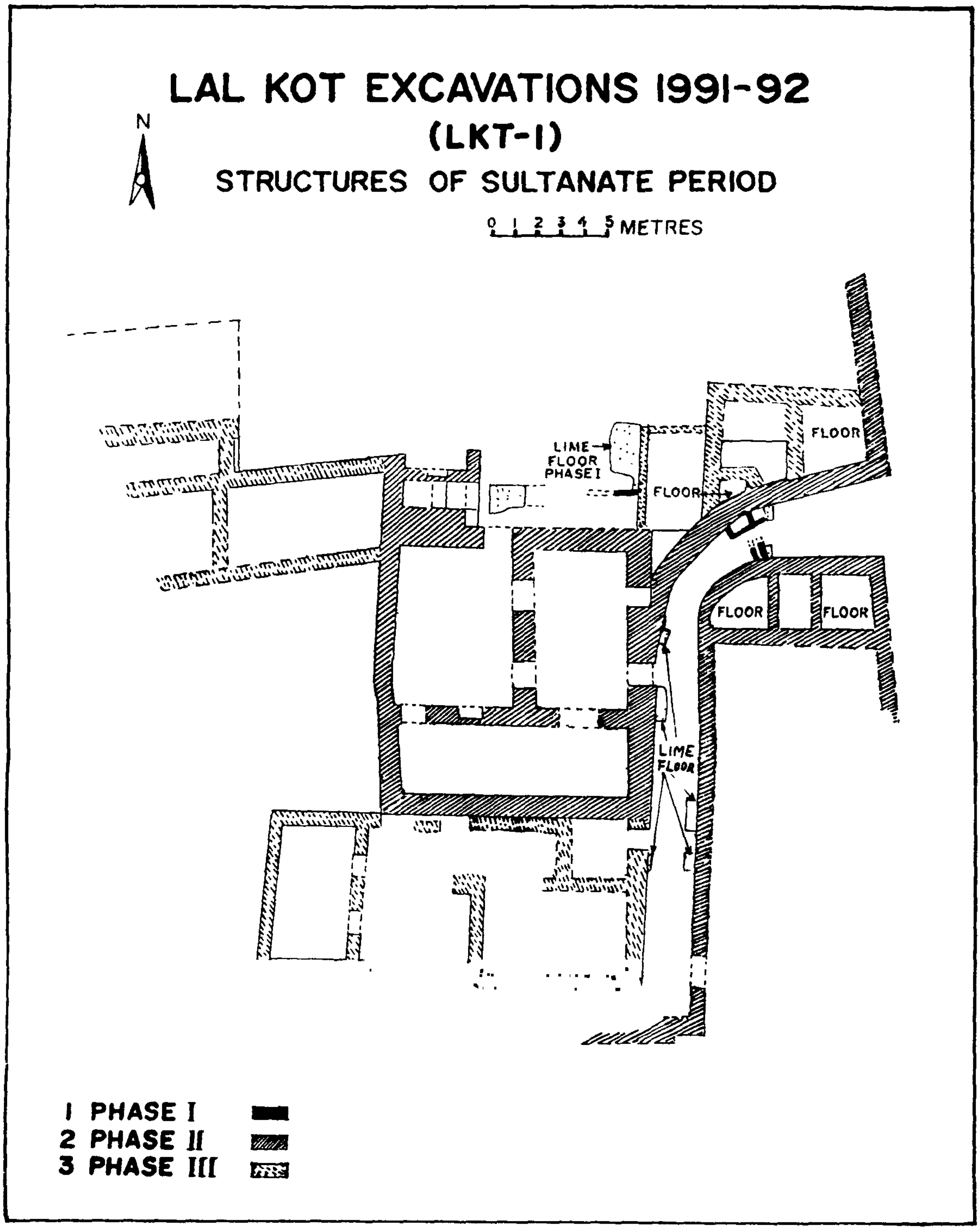

LAL KOT EXCAVATIONS 1991-92
(LKT-1)
STRUCTURES OF SULTANATE PERIOD
N
0 1 2 3 4 5 METRES
LIME FLOOR PHASE I
FLOOR
FLOOR
FLOOR
FLOOR
LIME FLOOR
1 PHASE I
2 PHASE II
3 PHASE III

Fig. 3

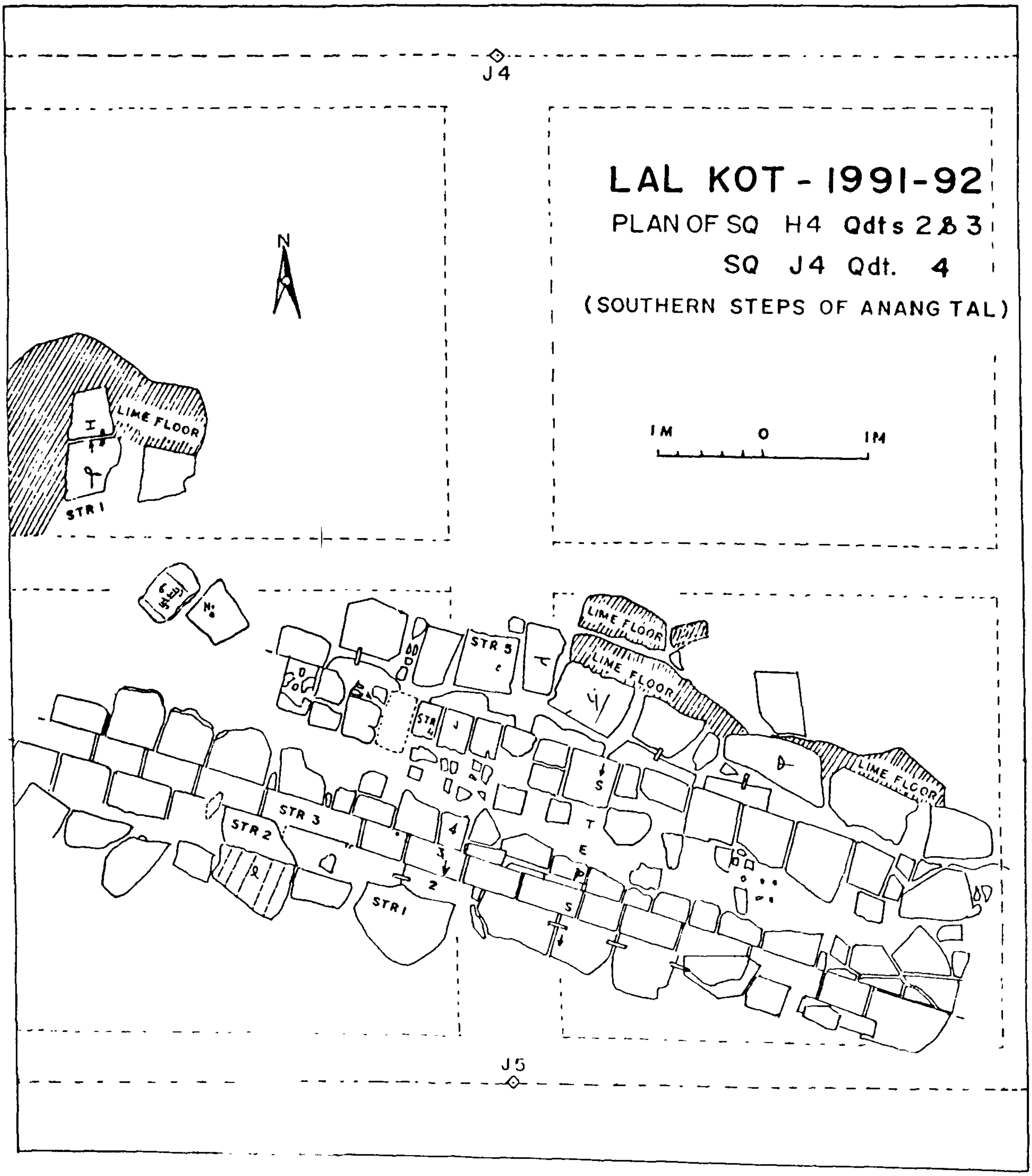

J4
LAL KOT - 1991-92
PLAN OF SQ H4 Qdts 2 & 3
SQ J4 Qdt. 4
(SOUTHERN STEPS OF ANANG TAL)
N
1M 0 1M
LIME FLOOR
STR 1
STR 5
LIME FLOOR
LIME FLOOR
LIME FLOOR
STR 3
STR 2
STR 1
S
T
E
P
S
J5

Fig. 4

the Tughlaq period the site was fully uninhabited. Not any specific evidence of a succeuding period was found in the excavations.

In the tank area of the adjoining Anang Tal the upper part is partly exposed in the south-western corner. the exposed area suggests some types of steps or retaining walls with wide and long platform of the tank. This also suggests that the repairs or additions were done after the period of its original construction most probably by Anang Pal II. The wide platform of thick lime concrete plaster was strengthened by semi-dressed stone blocks tightened with iron clamps and just over it the side wall of the step was partly repaired with rectangular blocks of dressed stones also tightened with iron clamps. The remarkable feature of the Rajput period was the presence of incised mason marks on the semi dressed stone blocks which were used in the construction of the tank. Amongst the mason-marks the symbols of *swastika*, trident, circle divided into four parts, drum, numerals, letters, scorpion, bow and arrow are found which resemble such mason-marks as found in the temple of Bhojpur (M.P) of the same period (Pande 1992:25) and also on the reused stone slabs in the Quwwatul Islam Mosque near Qutb. The name *Pinasi* is found in Nāgarī characters on one of the stone blocks. These evidences clearly suggest that the tank was originally constructed in the middle of the 11th century A.D., most probably by Anang Pal II whose name is conjured with it. (Fig. 4).

Explorations

The explorations by the author made during the last three years suggest that in the protohistoric period a number of settlements swelled all over and around Delhi. The settlements continued in the historical periods very likely as separate urban enclaves or townships under the city of Indraprastha (fig.5).

In August - September 1991 a joint exploration of Delhi area was undertaken by the Archaeological Survey of India under the directions of C.L. Suri and the author alongwith I.D.Dwivedi, Ashvini Asthana and other officials of Excavation Branch II and Delhi circle. The sites visited by the joint team were Kharkhari Nahar, mound of Gordon Highlanders Column, Bhorgarh, Loni, Mandoli, Jhatikra-1-all having protohistoric and early historic remains and Bankner, Majnu Ka Tila, Kot, Jhatikra-2 and Jhatikra-3 - all with early historical and medieval period remains. The aim of the exploration was to spot out the sites of archaeological importance in the map of Delhi as the growing constructions and levelling of old mounds have effected the whole of the city including its village areas. The ancient mounds known to the archaeologists at Majnu Ka Tila, Timarpur, Badli-Ki-Sarai, Khera Kalan, Jogabai mound have almost vanished. Among the explored sites, mounds at Kharkhari Nahar have been levelled to the ground after removal of nearly 2 to 3 metres of deposits; at Bhorgarh among the 3 mounds, one is fully inhabited while the other has been levelled and further dug for taking soil for bricks and the third one is gradually being sliced from all the sides for making more space for agricultural fields all around and portion is being occupied by modern graveyard amidst the levels containing structures of Kushan period; at Bankner the area of the mound has been utilised for construction of modern houses and the remains can only be seen at certain thin exposed sections. The high mound of Loni already known to the archaeologist since long, is in the tapering cylindrical shape with little scope for exvavations because of the occupation of mound at every level and the mound of Jhatikra-3 has already been levelled. It was noticed that excavations if undertaken at Kharkhari Nahar, Bhorgarh, Jhatikra-1 and Kot may prove to be fruitful as all of them are potential sites which may throw fresh light on the history and archaeology of this area. The details of the cultural assemblage of explored and revisited sites are given below -

1. *Kharkhari Nahar (Lat. 28° 35' 10" N, Long. 76° 57' 15" E)*

The site at village Kharkhari Nahar near Najafgarh in the area of Jafarpur Kalan police station in the South-West Delhi was discovered by the author on 4th April, 1990 when he was accompanied by Asad Faruqui, Dy. Commissioner of Police, South-West District, Urmila Sant, S.P. Rohatgi and Jagdish Chander of the Survey as some gold and silver ornaments were reported to have been found kept in an earthen pot in the fields near the village. The ornaments,seemingly of late medieval origin in posession of Delhi Police were examined and were as follows:

a) Wristlet made of lead, the upper portion of which was covered with a thin sheet of gold having a lengthof 12.2 cm. and mean diametre being 6.6 cm.

b) Silver bracelet having a diametre of 8.2 cm. and thickness being 0.8 cm.

c) Solid silver necklet *(hansli)* with a diametre of 14.5 cm. and thicknes of 0.5.

d) Four different broken pieces of solid silver necklets.

The fields all around were explored and it was found that in the near past the mounds which existed there were levelled and pottery was scattered. At two places, because of the location of a neem tree and a room housing tube well, small parts of the mound were left having their exposed sections with heights of about 2 metres and 2.5 metres respectively. From the latter section sherds of Painted Grey Ware, grey ware and red ware were

collected. Late Harappan pottery with close affinity to late and degenerate Siswal Ware and Bara elements and black-and-red ware were also collected. Black-slipped ware and Śunga - Kushan red ware found there points to the site being utilised by early historical man. Medieval period pottery is also found in abundance. The site was revisited in September 1991 alongwith C.L. Suri and his team of Excavation Branch II, New Delhi and the team of Delhi Circle of the Archaeological Survey of India. The two remaining portions of the mound were found levelled. A large number of pottery found earlier also were again collected. The important finds of this visit was the discovery of terracotta cake, terracotta toy cart frame, terracotta bangle pieces, terracotta ball, terracotta bead, bone point, bricks and stone objects.

2. *Gordon Highlanders Column (Lat. 28° 43' 20"N, Long. 77° 10' E)*

The site, near Badli-ki-Sarai represented today by a small mound of about 4 metres in height has a red sand stone column at the top erected in the memory of soldiers who died in the battle of Badli-ki-Sarai in the Revolt of 1857. One grave is also located on the mound. The Painted Grey Ware association of the mound was noticed by the author in 1989 and a proposal was prepared by him for the protection of the site. The site was visited several times and by the joint exploration team also in September 1991. A very large number of Painted Grey Ware sherds were collected besides grey ware, Chocolate Ware, black-and-red ware, plain and painted black-slipped ware, Kushan and medieval ceramics like black slipped grey ware. A terracotta ball was also found.

3. *Bhorgarh (Lat. 28° 49' 45" N, Long. 77° 5' 15" E)*

Bhorgarh in the north Delhi near Narela is the best preserved mound of proto-historical and early historical periods. Originally there were three mounds as mentioned before. The intact mound which is being cut from all sides measures about 100 metres in north - south and 57 metres in east-west direction. That the mound has been cut both from western and eastern side is very much clear as it was about 130 metres (Madhu Bala 1977:43) in east-west orientation about 15 to 20 years back and thus more than half of the mound has been levelled to the ground during this period. The exposed section on the eastern side shows an average thickness of about 4.50 metres of cultural deposits. The site was visited by the joint exploration team in September 1991 and fairly large number of Painted Grey Ware, both with deluxe and coarse varieties, grey ware, black-slipped ware, black-and-red ware, Norhtern Black Polished Ware, Kushan pottery including stamped designs of *Śrīvatsa* and other ceremics of medieval period including chocolate painted grey ware with stamped lotus design and a few sherds of glazed ware were collected. From the south-western side of the mound a small stone sculpture of the bust of a female deity was also recovered. Three Polished stone pestles, stone dabber, terracotta animal figurine and bead and medieval glass bangles were also collected. Two brick structures of the Kushan period have also been repored earlier from the site having 7-8 courses of bricks, the size of bricks 18x24x7 cms. (Madhu Bala 1977:46). Similar brick structure with 8 courses of burnt bricks was again encountered in the western section of the mound during September 1991. Pieces of roof tiles were collected. Among other notable finds mention should be made of Kushan copper coin with thick incrustation. Iron slags were also found at the site.

4. *Loni (Lat. 28°45' N, Long. 77°17' 30" E)*

On the left bank of Yamuna, Loni seems to have been a great centre of protohistorical activities. The height of the remaining portion of the mound is around 15 to 20 metres and the slopes all around have been levelled to the ground giving a tapering cylindrical shape to the mound. It was found to be very difficult to study the nature of the mound and get a better idea of the cultural deposits. On the western side of it near the road a section of about 6 metres in width was found exposed, rest of the sections have constructions against them. It was noticed by the joint exploration team in August 1991 that the Painted Grey Ware has a very thick deposit which is preceded by a phase containing water-logged red ware and followed by thick deposits of other cultural periods. The early historical period is further evidenced by pieces of fine black-slipped bowls taken out from the sections.

5. *Mandoli (Lat. 28° 42' 10"N, Long.77°18' 30"E)*

Mandoli is the late Harppan site towards south of Loni on the left bank of Yamuna. The site was visited by the joint exploration team in August 1991 and ceramics of late Harappan period, Painted Grey Ware culture and early historical and medieval periods were collected. A few years ago the site was under excavation by the Department of Archaeology of the Delhi Administration, the details of which are awaited.

6. *Jhatikra (Lat. 28°31' 15"N, Long. 76°58' E)*

Jhatikra is located towards south of Najafgarh, about 7 kms. from village Kharkhari Nahar in south west Delhi. there are three separate mounds located in almost north-south orientation and each having a distance of about 500 metres in between. The mounds were explored by the joint exploration team in Septembeer 1991. Jhatikra-1 or the central mound is the largest and most

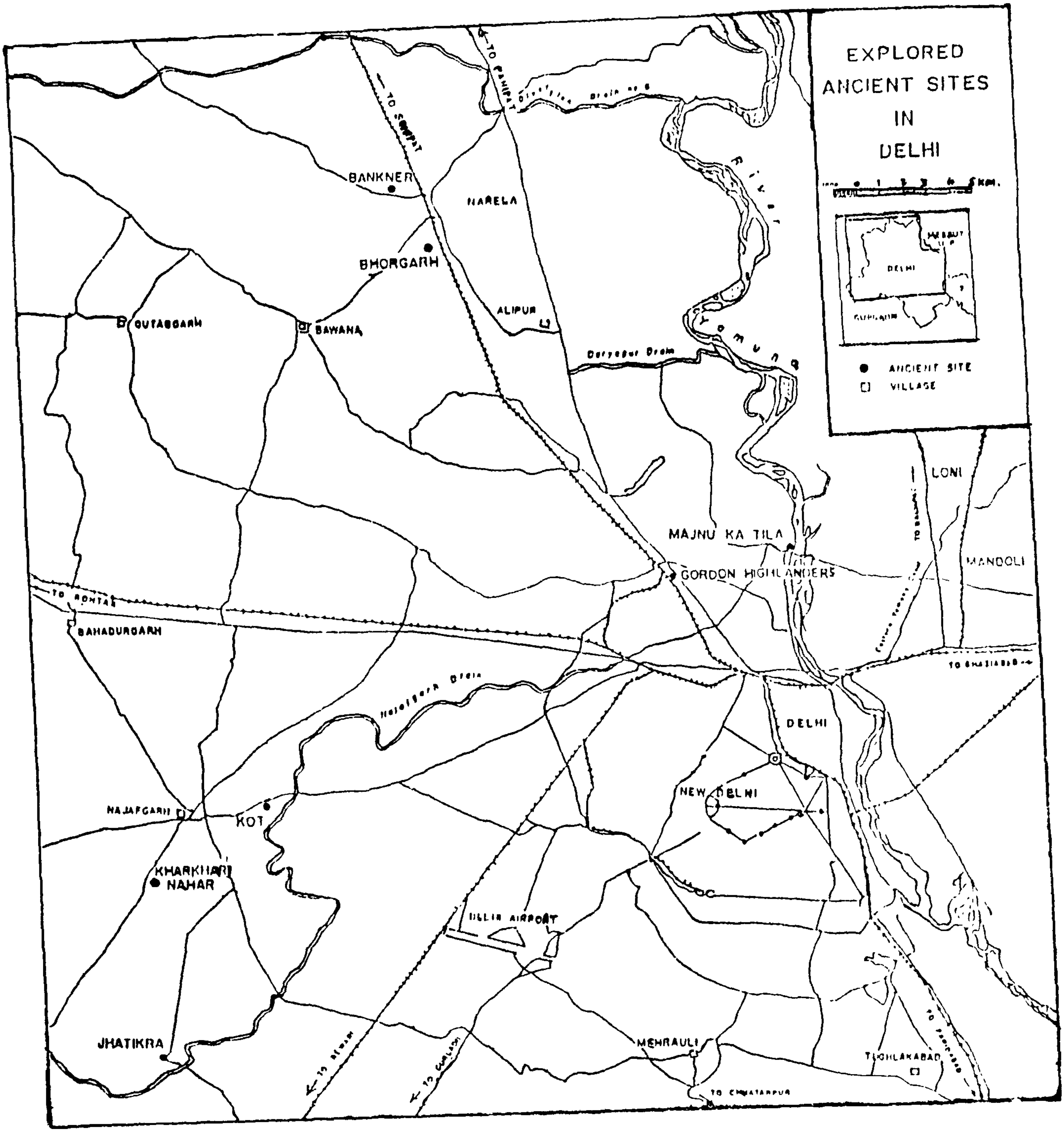

EXPLORED
ANCIENT SITES
IN
DELHI
ANCIENT SITE
VILLAGE
BANKNER
NARELA
BHORGARH
ALIPUR
QUTABGARH
BAWANA
River Yamuna
LONI
MAJNU KA TILA
GORDON HIGHLANDERS
MANDOLI
BAHADURGARH
DELHI
NEW DELHI
NAJAFGARH
KOT
KHARKHARI NAHAR
JHATIKRA
MEHRAULI
TUGHLAKABAD
TO PANIPAT
TO SONIPAT
TO ROHTAK

Fig. 5

important as far as habitational deposits are concerned. The mound is not disturbed much and the sections are rathert exposed very less. The height of the mound from the surrounding ground level is about 6 metres. Besides a few sherds of Painted Grey Ware the site revealed grey ware, black-slipped ware, black-and-red ware, Kushan red ware and medieval ceramics including red ware, both plain as well as painted with black colour with criss-cross designs, glazed pottery-both with sandy friable core and terracotta core, white and chocolotate painted grey ware and a piece of Chinese porcelain. Other important finds from the mound include 3 copper coins, possibly of Sultanate period, stone bead, glass bangles of many types of medieval period, a stone ball and pieces of medieval glass bottles. A Mughal period mosque is located on the eastern side of the mound with lakhauri brick structures and lime plaster with a vaulted roof over it.

Jhatikra-2 is the mound towards its south near the village Badusarai and has revealed remains of medieval period, mostly of the Delhi Sultanate or Mughal periods where plain and black painted red ware, a sherd of chinese porcelain, an iron sickle and glass bangle pieces were found.

Jhatikra-3 is the mound towards north of Jhatikra 1 in the area near village Kanganheri. The mound has been levelled, the earth mostly removed. Some potsherds of early historical origin including a sherd of black-slipped ware suggest the site having a long historical background. Plain as well as black painted red ware, a few iron objects and medieval green and blue glass bangles were found there. Among noteworthy finds, mention may be made of five decorated pieces of a brass object, a carnelian bead and a few stone objects like qurerns. A part of clay hearth was also noticed at the site.

7. Bankner (Lat. 28°51' 10"N, Long. 774' 30" E)

Bankner is located at a distance of about 4 kms. north of Bhorgarh. The site which is also called Bajukhera is almost destroyed by modern building activites. During the visit of joint exploration team in September 1991 grey ware, red ware and pottery of early and late medieval periods were found. Painted Grey Ware has also been reported earlier from the site, but it was not noticed during the explorations. Apart from a small portion of the mound on the western side rest of the same is almost covered with modern constructions. A terracotta lamp, a terracotta hopscotch and a polished stone piece with three deep cut marks were found at the site.

8. Majnu-Ka-Tila (Lat.28° 41' 35"N, Long. 77° 14" E)

The old mound located towards north of Kashmiri Gate on the right bank of Yamuna has been completely levelled to the ground. However, during explorations conducted by the author on the right bank of Yamuna in Delhi in the winters of 1990 black-slipped ware, grey ware and red ware including a sherd of pot with perforations of early historical period and red ware-both plain and painted with black colour ,black slipped grey ware and other associated pottery of medieval period were found from the accummulated debris after levelling of the ground. A terracotta bead was also found. Painted Grey Ware has been reported from the area in the past, but no such sherd was found during the explorations.

9. Kot (Lat. 28° 36' 20" N, Long. 77° 0' 45" E)

Kot is a rectangular mud fort located towards east of Najafgarh on the west bank of Najafgarh drain. It has two corresponding gaps in its mud walls on northern and southern sides indicating locations of gateways. The inner central area of the fort does not seem to contain any remarkable habitational deposit, but all along the walls medieval period potsherds can be collected from the inner side. The site was visited by the joint exploration team in September 1991 and medieval red ware including a sherd with stamped design of sun, black painted red ware, grey ware, black-slipped grey ware, glazed ware with sandy friable core and discs made out of them and other associated ceramics were collected. A sherd of chinese celadon, a terracotta ball and a glass bangle piece were also found. Towards north-west of the site is located the village Sakraoti (Śakrāvatī) Nagli which seems to be a very early name like Indraprastha and which also contains the name of Indra (Śakra). It is possible that this mud fort came up during the early medieval period by Rajput rulers and served the purpose of military outpost even as late as the Sultanate period. The evidence of remains of brick wall abutting it in the south-eastern side facing the Najafgarh drain suggests the possibility of brick-strengthening of the fort wall at a later period. The correct picture about this interesting fortification could be possible only after it is properly excavated.

The plumaged ensemble besides producing echoes from the past may go a long way into redressing the racial and elemental problem of reconcilliation of the traditional and the modern which is more or less acute in this historic city, where a new urbanisation zone is being created.*

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Excavation at Vadagokugiri (Meghalaya) 1992

A.K.SHARMA

Meghalaya is known for her hills, clouds and rains. Presently it has been classified as tribal area inhabited by different tribes. As per known history, its cultural heritage does not go back to ancient times. But recent excavations conducted by the Prehistory Branch of the Archaeological Survey of India in Garho Hills have now clearly proved that the area was culturally, socially and economically very prosperous and advanced right from the beginning of the Christian era.

The site

Vadagokugiri (Bhait-Bari) (25° 51' N, 90° 2'E) is located 235 kms. West of Guwahati on the left bank of earlier course of Brahmaputra in West Garo Hills. Major part of the site and structural remains are located on highly dissected and moderately elevated hill tops mostly composed of red loam and lateritic soil. Nearly 3 Months of scientific excavations have sufficiently proved that this was one of the biggest city, a religious centre east of Brahmaputra river from 4th Century A.D. or even earlier. The excavations so far has clearly demonstrated that Wadagukogiri was a sprawling township with Buddhism, Hinduism (Śaivism) and the amalgamation of the two being widely practiced in the area. The ancient township was located on the left bank of Brahmaputra which nearly 2000 years back was flowing nearby. The township was well fortified and was having a large number of tanks inside. On the banks of these tanks and on other prestigious heights were located a number of burnt brick temples. Nearly 20 temple sites have have been located so far. Evidences clearly show that there might have been other complexes and habitational areas for the ruling class and common people of the town.

Archaeological Survey of India, Nagpur.

I. *The Stupa*

A mud-cum-brick stupa (Fig1, P1. XIII) on the western fringe of the fortified township has been discovered. The stupa is located just in front of the water way entrance to the town. It is 5.75 m high and has a diameter of 30 m at the bottom. It is the first stupa discovered in Meghalaya.

The whole structure is built in a pyramidal fashion with three receeding tiers of brick platforms. On the southern side where the brick structures are more intact, on each side of the central flight of steps three rectangular boxes have been raised. These boxes have been filled with brick bats and compact clay. Maximum length of the rectangular boxes is east-west. The walls of the boxes are 0.50 m wide.

In the receeding order the lowest wall is 12.70 m long, second wall is 9.00 m long, third wall is 5.10 m long where on the top most wall is 4.20 m long. Inner width of the lowest box is 2.25 m, middle box 2.10 m and the top-most box is 1.85 m. The space below the lowest rectangular has been paved with brick bats. The total length of the flight of steps including the two platforms of paved bricks at the lowest two levels is 13.60 m. In total there are twenty six flights of steps with each step 0.30 m in width and 1.10 m in length east-west. Below the lowest step there are two brick paved platforms at two levels. The first one is 1.10 m in length. The flight of step are lined by 1.20 m wide on both sides, i.e. on east and west. above the topmost step and box, the remaining space upto top of stupa is filled with rammed earth. On top there might have been Hermika which is missing. maximum courses available in the walls of the steps are eleven whereas in the walls of the rectangles upto sixteen courses are available.

II *The Earlier Inhabitants*

Further digging below the bottom of the stupa another three habitational layers have been encountered from

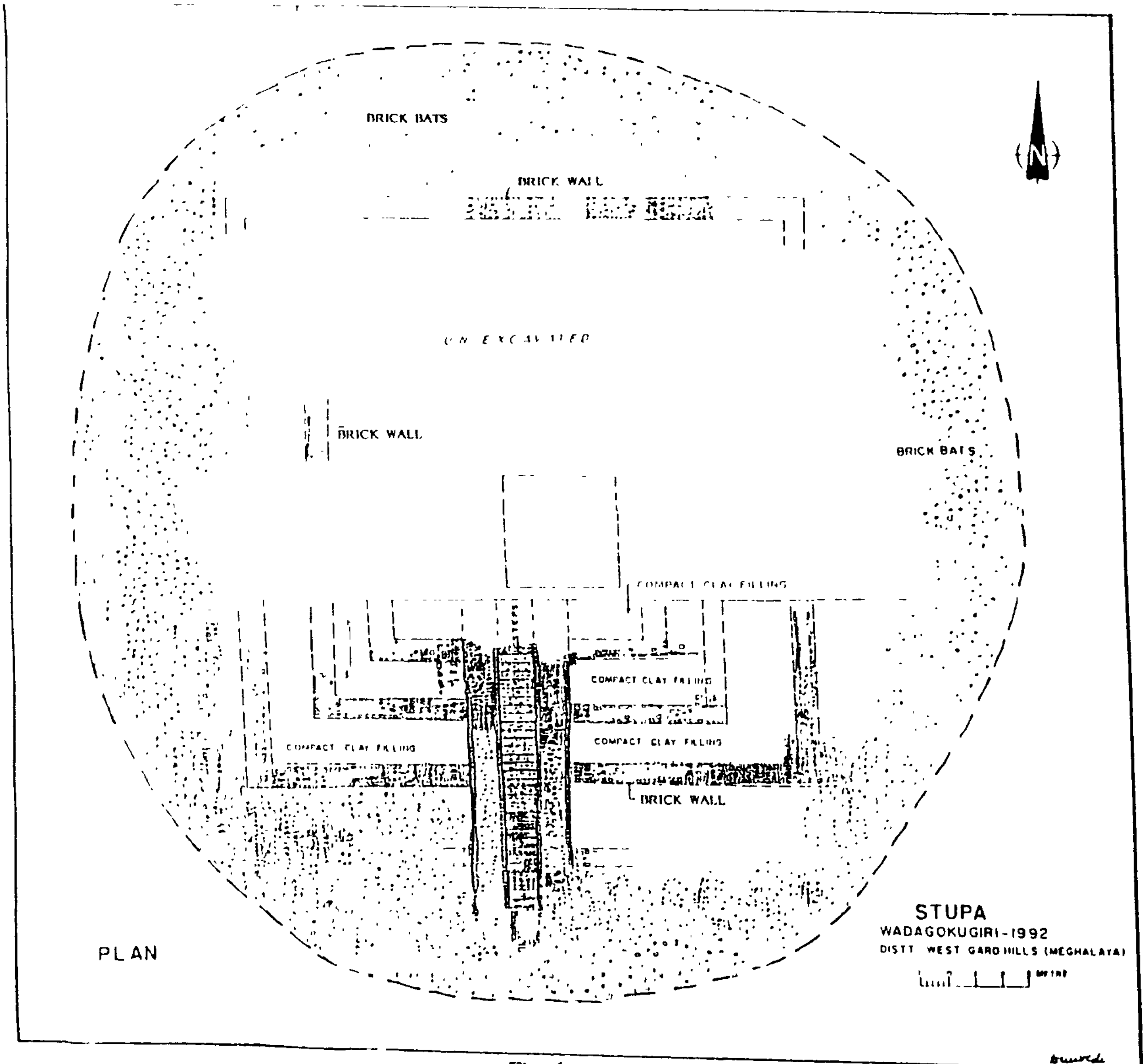


Fig. 1

surface the depth of 0.40 m from the present ground level. These layers have yielded brick-bats, fine grey-ware, charcoal, animal bones, refuge pits and rammed floor. The floor of the house are heavily burnt. Over the floor a thin layer of fine river sand is found This indicates that there was heavy flood, due to which the people occupying the area abandoned the place. As the bottom most habitational layer and house floor is below the present day ground level, it shows that the river bed was much deeper with high enbankments and plenty of deep water flowing in it. Layer three and pits cut into it have yielded hand-made grey and red-ware The pottery is thin. Grey wares are decorated with stamped circular designs while red ware on outer surface have straw designs.

The occurence of hand-made pottery from the lowest level pushes back the antiquity of this settlement beyond 2nd century B.C. The pottery could be Compared to those from Sekta in Manipur and similar pottery found in various sites in Indo-Gangetic Plains.

III. *The Temple Sites*

Investigations so far conducted indicate that there are at least two groups of temples, one located almost in the centre of the township and the other on the south-western side near the river bank. In each group at least ten to twelve temple sites could be located. In the first group there are two tanks,

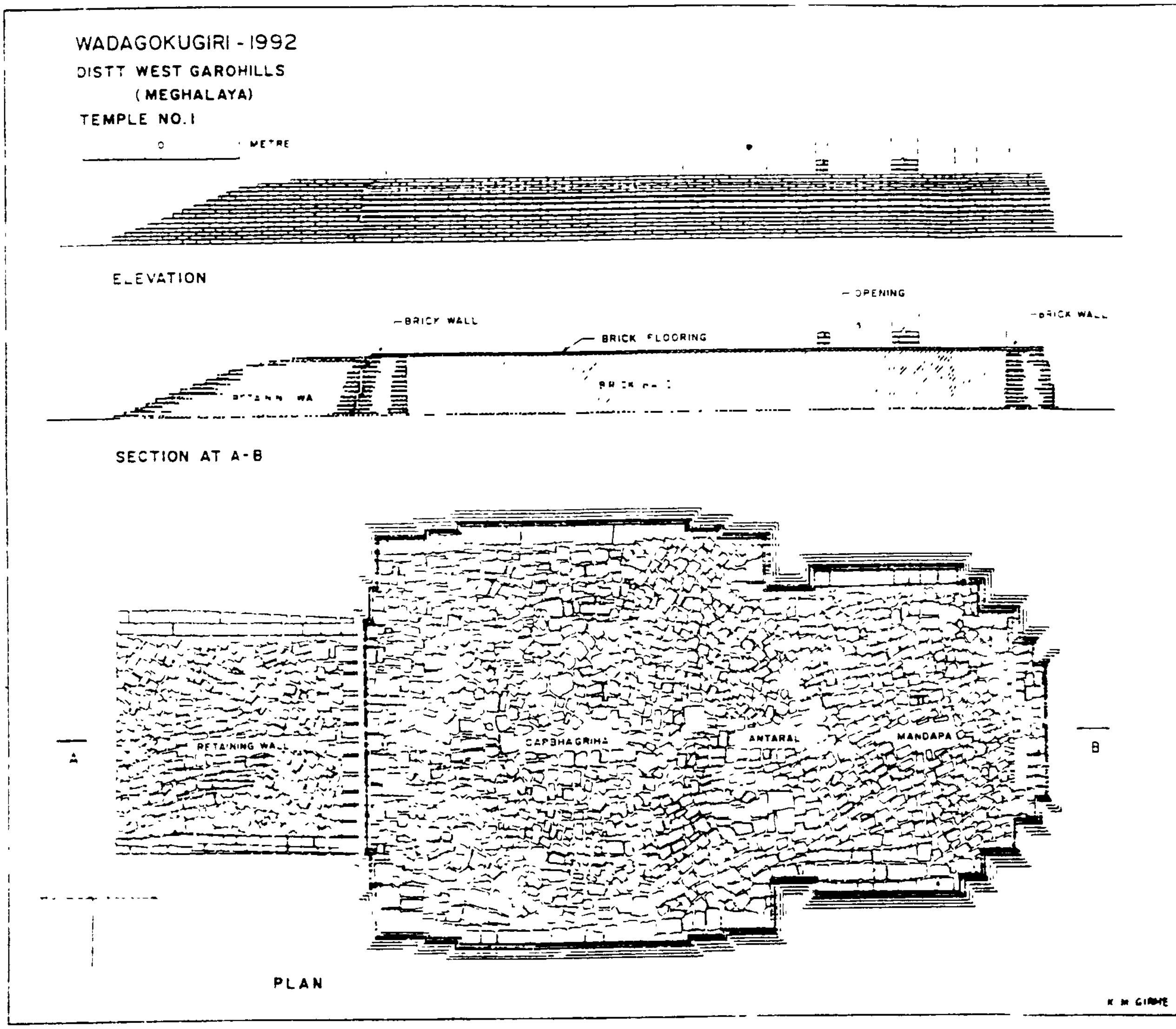


Fig. 2

one bigger and another smaller. Most of the temples of the second group are located around a beautiful rectangular tank which has still plenty of water and blooming red lotus flowers.

A. Temple No.1

Plan of a beautiful burnt brick Temple (Fig 2) has been exposed. The temple is Composed of three Components, the Garbhagriha, the Antarala and the Mandapa. It was facing east and the outer walls were decorated with beautiful terracotta tiles. Maximum length of the temple east-west including the retaining wall behind the garbhagriha is 11 metres. The retaining wall is 2.22 m in width. The temple has been built on 'Panch Ratha' Plan with several offsets. The foundation consist of brick rubbles. Both the Garbhagriha and the Mandapa are square on plan inside, the Garbhagriha is 4.40 x 4.40 m Whereas the Mandapa is 2.50 x 2.50 m. The Antarala is 0.90 m in width. The walls are made up of burnt bricks of the size 27 cm and width of the wall is 40 cm. Nearly 13 courses of bricks are available. It is interesting to note that the evidences of puja that might have been performed before dedicating the temple to the God are fortunately available in the form of circular rammed and charred earth having charcoal just in front of the entrance to the mandapa. All around the temple evidences of erecting scaffoldings are available in the form of post holes. This is for the first time that such post

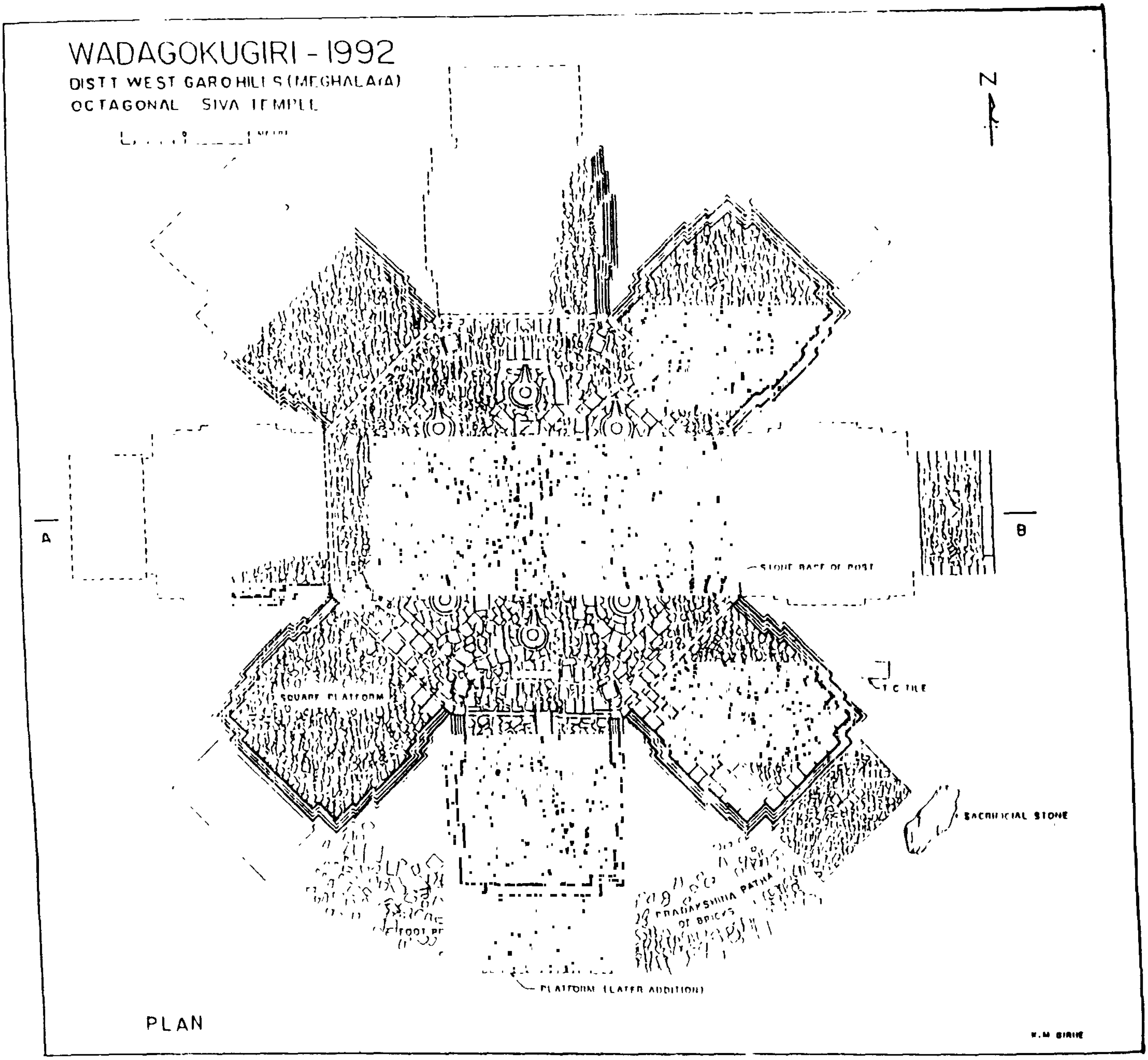


Fig. 3

holes for scaffoldings have been noticed. Except the back side of the temple, all the other three sides and particularly the space between the two corners of the rathas were decorated by terracotta tiles above the tala and below the greeva region. The tiles were fixed on the walls with the help of one or two holds luted on the back of the tiles. They vary in size from 35 x 25 x 3 to 46 x 25 5 cms. The tiles recovered depict the figures of gods, goddesses ascentric figures, Yoginis, ascetic pregnant woman seated with outstretched legs, dancing figures, (Pl. XIV) etc. The noteworthy amongst them are :

1. Four armed Galnesha holding para]su in upper right hand, mula in upper left hand, modak in lower left hand and lower right hand in varada-hasta mudrā. Some of the figures

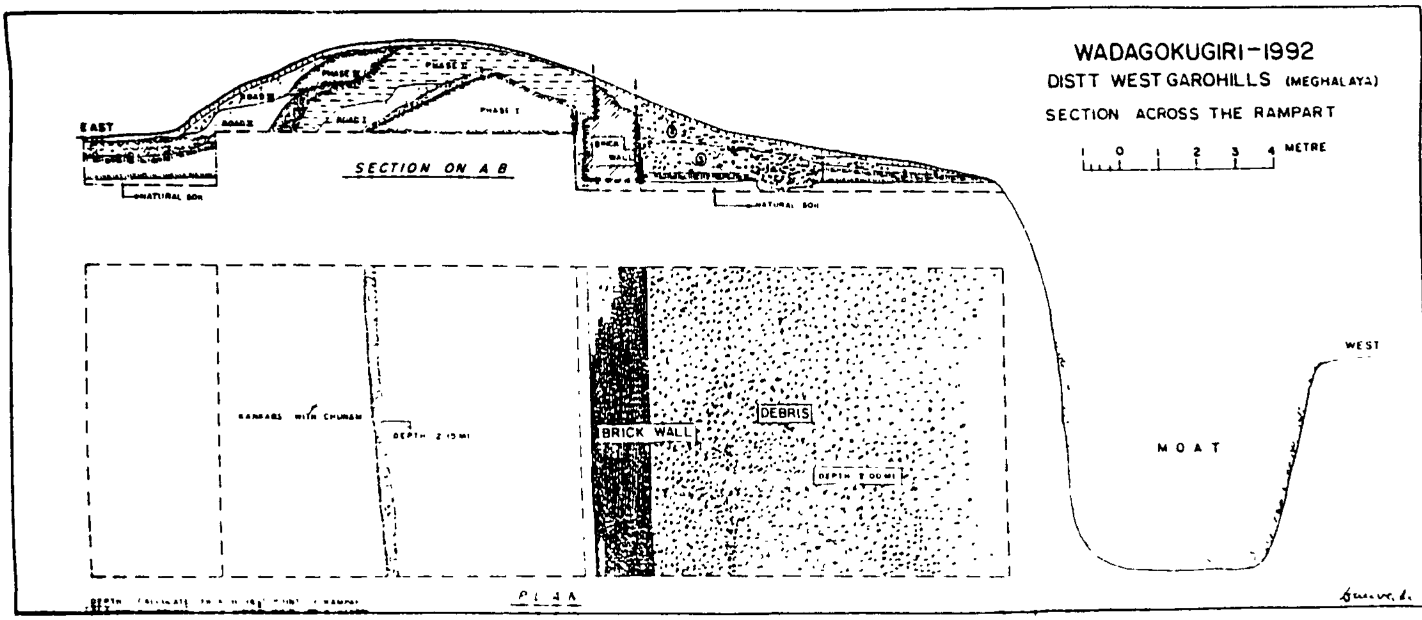


Fig. 4

are shown seated inside a temple. He is always accompanied by his vāhana the Mushaka (rat). The sacred thread is in the form of a serpent.

2. Shri Rāma in bow breaking mudra, wearing kirīṭamukuta and Kundalas.

3. Pārvatī - Four armed, seated in padmāsana in Dhyānamudrā, flanked by two ladies one each on left and right. At the bottom another figure is squatting pose has been depicted.

4. Āśutosha Bhairava with ribs and sinuses finely depicted.

5. Tāḍakā in her demon form wearing beaded necklace.

6. Kālī with desevelled hairs and protruded tongue, dagger in her right and kapāla in left hand. She is wearing Muṇḍa-māla.

7. Saraswatī with veeṇā.(Pl. XV)

8. Mridaṅga Vādaka.

9. Arjuna in penance - the emaciated figure of Arjuna the hero of mahabharata epic has been depicted. He undertook a penance to secure from Śiva a powerful weapon to destroy his enemies, who had deprived him and his brothers of their kingdom.(Pl.XVI)

10. Brahmā - Four armed seated in Padmāsana in Dhyāna mudra. On the right upper portion of the tile flying Vishṇu has been shown holding a garland whereas the left portion is missing. (Pl.XVII)

11. Durgā

12. Horses in a row - In a bottom fragment of a tile five caprisoned horses in a row have been depicted. It is quite clear that they are the remaining five of the seven horses of chariot of Śurya.

The figures have been beautifully carved out in relief and and each one is a masterpiece of art. An anthromophic stone Kept on the southern side of the temple has also been recovered which appears to have been used as a sacrificial stone. On the stylistic grounds of the terracotta tiles, the temple could be dated to around 9th-10th century A.D. Discovery of engraved elevation model of a temple on two huge boulder in a nullah within the fortified area shows that the temple was probably a rekhā-deul type, the śikhar of which was atleast six-storied. In one of the boulders the āmalaka and Kalaśa portion is missing whereas in the other only these portions are present. But they are definitely two different entities. These engraved models show that before construction of the temples, their modes used to be engraved on rocks.

B. The Octagonal Śiva Temple

An octagonal Śiva temple (Fig 3, Pl. XVIII) has also been exposed. This is unique in plan. The octagon is 6.90 m in diametre with its each arm measuring 2.70 m. The width of the walls is 0.40 m. Inside the main octagon there are 8 miniature octagons each having a śivalinga inserted inside a Yoni, centre of which is also octagonal to hold the Linga. The lower part of Linga is square. There ought to have been a miniature octagon in the centre also, housing a linga, thus making it a 'Nava-graha' type of temple.

Enquiries revealed that the central linga was taken away by a local and installed in a newly constructed temple in a nearby village few years back.

In a bid to search out suspected hidden gold,the local people had dug out miniature octagons. In the process out of the process out of the removed remains, lingas were taken away by Koches and kept in their house whereas circular 'Yonis' and square stone bases of wooden pillars have been used by Garo family as base stones for their bamboo hut. The entire floor of the temple is paved with burnt-bricks. from the arms of the main octagon raiate eight square platforms, each arm of which is again 2.70 x 2.70 m. The side arms are Tri-ratha on plan with beautiful mouldings. The discovery of few terracotta tiles with figures indicate that the outer face of the walls above the floor level were decorated with these tiles. In one of the tiles śiva sitting on a naked body and holding a human head by hair in left hand has been depicted. The platforms were used for performing 'pūjā'. Later on, probably to increase the accommodation for devotees, to each square platform a rectangular platform measuring 1.15 x 2.70 m was added. At the junction of the two arms of the main octagon and between the two miniature octagons square stone pillar bases are found on which stood, most probably, wooden pillars to support the over-head roof.

The diametre from square shrine to square shrine is 12.30 m. Each Śivalinga had independent aporoach through the platforms.

From the amount of debri recovered and the constructional method adopted, it is clear that above the floor level, the supper structure was resting on wooden poles, eight on the corners of the main octagon, thus making the super structure also an octagonal one. The roof might have been of bamboo and grass, befitting the environment and the native constructional style.

The temple occupies a commanding posititon overlooking the mighty Brahmaputra in the west and Garo hills in the north and east. The entire structure was of well baked burnt bricks, whereas the Yoni, Linga and pillar bases were of stone. Viewed from a distnace the whole structure appears to be emerging from the earth.

IV. *Fortification*

The mud-cum-burnt brick fortification (Fig 4) runs into at least 5 Kms. in a circular fashion, a part of which runs along the left bank of the river. The fortification has been laid taking advantage of the contours of the hills. All along the outer side of the fortification a very deep moat runs, whereas on the inner side a rammed murrum pathway which is 3.30 m in width runs throughout the length of the fortification wall. Cuttings were made at two places in order to ascertain the width and stratigraphic position of the mud and brick wall. It is evident that in the first phase only a mud rampart, having a width of nearly 6 metres was raised. Later on, in order to further strengthen the outer face, a 1.20 m wide wall of burnt bricks was raised. Evidences show that the fortification wall was enlarged in width atleast thrice. So far 52 courses of bricks have been exposed. A study of one of the cuttings clearly shows that the burnt bricks wall was repaired at least twice and the wall was raised over the foundation of boulders. A gateway on the eastern side has also been located. There are a number of bastions at the turnings. There were atleast four gateways, one each in each of the four directions. On the western side, in front of the stupa, there is nearly a 40 m wide gap in fortification. The gap is now filled with silt. The two ends of the brick wall show rising trend indicating that there might have been a gateway to the river, through which berthed boats could be approached.

Inside the fortified area, particularly in the western half, there are well laid pathways paved with bricks bats, These pathways have been laid in such a way that they divide the whole area in squares and rectangles. They lead from one temple to the other, from tank to river etc.

Total absence of bones in the site

In all archaeological sites and particularly in habitational areas huge quantity of animal bones are found littered allover. Surprisingly, this is the only site where inside the entire fortified area including in the habitational areas not a single bone is found. This is an important factor and points out both to the religious nature of the complex and also about the sanitary habits of the inhabitants

Discussion

Vadagokugiri could easily be said to be one of the biggest habitations east of Brahmaputra. This ancient township appears to have been destroyed and deserted due to devastating floods of Brahmaputra after which the river changed its course and now it flows nearly 10 Kms away near Dhubri. Evidences of devastating floods are available. There appear to be tectonic movements also which have

resulted in tilting and caving in of the temples at various points. After the destruction of the town the inhabitants must have fled to the interiors of the Garo Hills and probably the inhabitants of the then prosperous area are now called the backward tribals. It is the law of the nature that those who are advanced today become backwards tomorrow and backwards today become civilized and advanced tomorrow. Nature has to maintain the balance. But one thing is certain that meghalaya had a glorious past and is going to have a glorious future. The darkness about its past has been lifted with discovery and excavation of vadagokugiri.

We find mention about this area of Brahmaputra by the Chinese scholar traveller, Hioven-thsang (Beal 1969), who visited Kamarupa in A.D.643. He describes 'The Capital town is about 30 li. The land lies low, but is rich and as regularly cultivated. They cultivate the Phanasa fruit and the Na-lo-ki-lo (Narikela) fruit.... water led from the river or from banked up takes (reservoirs) flows round the towns. The climate is soft and temperate. The men are of small stature and ltheir complexion is dark-yellow. Their language differs a little from that of Mid-India...They adore and sacrifice to the Devas, and have no faith in Buddha; ...There are as many as 100 Deva temples and different sectaries to the number of several myriads. The present king belongs to the old line (tso yan) of Narayana-deva. He is of the Brahman caste. His name is Bhaskaravarman, his title Kumara (Keu-mo-lo). From the time that this family seized the land and assumed the government till the present king, there have elapsed a thousand successions (generations). The king is fond of learning and the people are so likewise in imitation of him. Men of high talent from different regions aspiring after office (?) Visit his dominions as strangers. Though he has no faith in Buddha, yet he much respects Sramanas of learning....

On the east this country is bound by a line of hills. On the south-east of this country herds of wild elephants roam about in numbers; therefore, in this district they use them principally in war.

Going from this 1200 or 1300 li to the south, we come to the country of San-mo-ta-cha (Samatata). This country (Samatata) is about 3000 li in Circuit and borders on the great sea. The land lies low and is rich. The capital is about 20 li round. The men are small of stature and of black complexion, They are fond of learning. There are thirty or so Sangharamas with about 2000 priests. There are some 100 Deva temples. Not far out of the city is a stupa which was built by Asoka-raja...From Samataṭa going west 900 li or so, we reach the country of Tan-mo-ti (Tamralipti).

P.Gogoi (1962) writes that there were many Deva temples in Kāmarūpa during Bhaskara's time. The king begins his copper plate with a salute to Pinākī, that is Śiva. Bhaskaravarman worshipped Śiva not Kāmākhyā.

During the period from the 9th to the 11th cent. A.D., Kāmarūpa came under the sway of the buddhist pala kings of Eastern India. Stone inscriptions of Rajshahi say that Vijaya Sena (1079-1119) defeated the ruler of Kāmarūpa in war. The sena kings, who were of the Hindu faith, must have brought about a religious Change in Eastern India.

G.N.Bhuyan (1972-73) states 'the Bhaitbari plaques have also affinity with the late Pala and Sena artistic idiom in stylistic treatment, especially in the facial treatment and the existence of Jaṭā-mukuṭa on Gaṇesa's head. It can thus be reasonably supposed that the Bhaitbari city came into existence sometime in the 11th/12th century or, to be more precise, some of the structures, at any rate, came into existence during that period. This argument may push back the date of the establishment of the city even earlier.

Hioven-Thsang had written what he saw. Bhuyan has speculated about the date on the basis of few terracotta tiles. Now the present excavation has changed the whole position. No one has mentioned about the stupa from this site. we have discovered not only the stupa but evidences of earlier occupants of the site also. Befitting to the description given by Hiouen-Thsang we have so far located more than two dozen temple inside one fortified township. There is no doubt that there may be many more both within the....township of Vadagokugiri and in the adjoining Garo Hills. Hiouen Thsang's description about the land, cultivation of Phanasa (Jack Fruit), circulation of river water around the town and about people tallies with the evidence in and around Vadagokugiri. The original inhabitants, i.e. Garos are small in stature and dark-yellow in complexion. At Vadagokugiri there are a number of tanks (reservoirs), big and small. The town is sorrounded by a mud-cum-brick fortification wall on the outer side of which runs a deep moat which used to be fed by water from the river. The number of temple sites show that the dominant religion of the area was Hinduism.

On the east the area is bound by slow rising Garo hills. The deep jungles in south-east even today abounds in wild elephants. In the south is the country of Bangladesh, Samatata of 6th-7th century A.D. The Buddhist and Hindu remains of Mainamati and Paharpur in Bangladesh are the ones described by Hiouen Thsang.

In the absence of convincing evidences from any other site east of Brahmaputra, and with abundance of such evidences collected in only one season's dig from Vadagokugiri, it will not be too far fetched if we consider that is it township of Vadagokugiri and the area around it in Garo hills about which Hiouen Thsang wrote in 643 A.D. In that case it could be safely surmised that the antiquity of the site goes at least to the first half of 7th century A.D. Pottery and other habitational deposits recovered from below the stupa further push back the date of the beginning of this establishment (though on a much smaller scale, prior to the establishment of the fortified township) to 2nd 3rd cent. B.C. and decorated during this period, others might have existed even earlier. Thus the habitation at vadagokugiri existed for more than one thousand years. Beginning with a modest settlement the establishment prospered slowly and

became one of the biggest township around from 7th-8th cent. A.D. to 13th-14th cent. A.D. It was during this period of proseprity and abundance that Hinduism(Śaivism predominently) and Buddhism to a certain extent flourished. There is no doubt that the earlier rulers was very religious man, himself though a Śaivite, had respect for Buddhism also.

Further excavations at Vadagokugiri and explorations in the sorrounding Garo hills may clear the lurking doubts from our minds.

The terraced stupa at Vadagokuriri in Meghalaya could be compared to Chaukhandi at Sarnath (Lat. 25° 22' N; Long. 83° 1' E; District Varanasi, Uttar Pradesh) main shrine at Paharpur (Lat. 25° 2' N; Long. 89° 3'E; District Rajshahi, Bangladesh); Mainamati, 5 miles to the west of Comilla (Lat. 23° 25'N; long. 01°7'E; District Tippera, Bangladesh) and at Anti-Chak, District Bhagalpur, Bihar.

D.Mitra's doubts about Chaukhandi at Sarnath Stating that it is impossible to be absolutely definite as to whether it was a stupa or a temple' are now cleared from the evidence at Vadagokugiri. Here there is absolutely no later structures on top of the stupa. Except the possible hermika missing from the top, the upper portion is in tact. The destruction caused to the structure is onle on the slopes of the stupa and particularly on the northern side which is towards the river bank.

The most important factor to state that it is stupa and nothing else is the nature of its filling. from top to bottom the whole filling consists of compact hard clay without any layers. This could be achieved only when the process of raising the mud structure is continuous without any break till the top is reached. While dumping the earth sprinkling of water and ramming of earth is to be done continously to achieve one homogenous mass of earth and this homogeneity is available here. The stupa also appears to have been decorated with terracotta tiles as fragments of tiles have been recovered from the outer surface while cleaning to expose the terraces. As per information from local population bricks and tilies were taken away from here by people.*

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* The team of excavators comprised of A.K.Sharma, S.S.Gupta, Nizamuddin Taher, K.M.Girhe, R.K.Dwivedi, N.K.Nimje, Ghayasuddin, C.L.Yadav, P.S.Pashine, P.C.Dogra, S.M.Shambharkar, V.W.Pathak, T.B.Thapa, R.G.Katole and R.N.Sharma. Photographs and drawings are reproduced through the courtecy of the Director General, Archaeological Survey of India

Place Names, Traditions and Archaeology

A. SUNDARA

With the exception of a few works all literary works in our country, are essentially poetic not with sole objective of narrating the actual history of a person or land or event. How much history therefore has gone into such works, is often defficult to ascertain. Archaeological material remains are fragmentary and often beset with difficulties in the matter of correct interpretation.

Place-Names and Traditions

When a historian faces problems of filling the blanks rightly or of interpretation or of establishing authenticity by cross checking while dealing with such main sources, he looks for other materials that may provide missing links or analogies for proper interpretation. e.g. unrecorded local or regional legends, age old social beliefs and practices along with explanations in the form of stories coming under the purview of social Anthropology. Among these materials it is increasingly realised in the recent decades that place names play a significat role in the reconstruction of the cultural history particularly of localities.

Place names as a research tool should be taken in a broad sense not restricting them to proper names of villages, towns, or cities existing or exinct. It may even be a comon noun or even an expression for a spot in the revenue limits of a village or town or a part thereof that can unfold or help to find out an unknown part of the history of that place, when explored or investigated. Infrequently the name itself is impregenated with some historical or cultlural event or activity. Especially for an archaeologist, during his exploration, enquiry into the reason for naming a locality under investigation as such and its meaning are of considerable advantage. As on duty associated with the village-to-village survey of Archaeological remains continuously for quite a few years in the early part of my service in the Archaeological Survey of India from 1957 to 1970 and also later in the University to-date, I may give a few instances of varieties of how names of places or spots or parts of town or even region were found to be quite useful and singnificant.

Different Categories

1. In Dhūḷkhēḍ a village in India taluk, Bijapur dist. is an ancient mound of ash after which the village has the name: Dh = ash; kh = village. Daksha Brahmā of Puranic legend is said to have performed Yajna here as a result of which is the ash mound. There is also an ancient Śiva temple of 11th-12th century. These two are locally believed to be the evidences in support of the legend. A Careful examination by me of the mound (1968) in 1957 revealed that it is due to the human habitation in the past. The material remains therein such as pieces of redware pottery vessels with pre-firing geometrical designs in black on the exterior, long thin ribbon like blade tools made on semi-precious stones: chalcedony, agate etc. are of the people in the protohistoric Chalcolithic stage datable to 1500-800 B.C. and characteristic features of the chalcolithic culture of the upper Godavari valley, Maharashtra, clearly indicating the diffusion of the culture from there into the Krisna valley along the Bhima (Sundara, 1970: 109-119; 1971: 54-61). It is found that in villages with names with Dhūḷ or Būḍi or Vibhūti or Hal as the first or last part like Būḍihaḷ, Vibhūtihaḷḷi are ancient human habitation sites generally of the protohistoric period. In Terdal e.g. (Jamkhandi Tq. Bijapur dist.), about 3 km. away is a spot know as "Vibhūti Maḍḍi". Local People say that in times of yore their village was first founded there. The spot in

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explorations there in 1965 was found to have a Chalcolithic human habitation with Late Harappan cultural elements, of c. 2000-1000 B.C. (Sundara 1971:13-30). Būḍihāḷ in Surpur Tq, Gulbaraga Dist., another locality with same name in Bilgi Tk, Bijapur dist are with enigmatic scoriacous ash mounds of cultural singnificance (1987:313-325).Names like Hirehal (Ron Tq, Dharwad dist.) meaning deserted habitation site of ancient period are of similar significance. What people say about the antiquity of their ancestors' habitation in some cases associating with great person of the Purānas capsuled in the village names is found partially correct.

2. Places with names ending with 'kal' or 'aḍka' generally are found to have Iron Age Megaliths of c.1200-200 B.C., 100 A.D., a protohistoric cultural stage in South India. Hidkal (Hukkeri Tk, Belgaum dist.), Pattadakal a celebrated place for early temple forms of India, Akkaragal (both in Badami Tk, Bijapur dist), (Hire) Benkal (Gangavati Tk, Raichur dist.) are abundant in structural megalithic burial chambers of two principal types: the passsage chamber and the port-hole chamber of the period 1200-200 B.C. It would be of interest to note that in Dakshina Kannada place names ending with 'aḍka' (to inter or conceal) in the region are of similar significance. Similarly is the word 'Koṭṭa' in Uttara Kannada. For example Hiriyaḍka (Udupi Tq, Dkshina Kannada dist.) is known to have Megalithic burial chambers excavated in the laterite plateaux. It is found elsewhere i.e. in Kerala that such excavated chambers were meant for interring ceremoniously human skeletal remains along with iron tools and objects and pottery vessels of certain distinct variety described as the black-and red ware. There are a few places with names ending with 'aḍka': Ariaḍka (Puttur Tq.), Hariharapallatadka, Kalmadka (Sulya Tk.), Hatyadka (Belthangady Tk.), Kiriyaḍka, Pālaḍka, Mullaḍka all in Kaṛkala Tk, Panyḍka, etc. Also in Dakshina Kannada there are place names ending with 'Kollu' as e.g. Jadakalu (Kundapur Tk.), Panjikallu (Bantwala Tk.). It is worth-while to investigate these places in the light of the successful discoveries of archaeological remains in places with similar names elsewhere.

3. Another category of names is applied since long generally to uninhabited ancient burial sites, paticularly Megalithic burial sites in different parts of South India. the names are: Bhasmada-kaṭṭe, Moriyara mane, Munivāsa guhā, in Karnataka, Neelu Raloo in Andhra Pradesh; Vali Veedu, Korangapatti in Tamilnadu-Kerala, Pandavara katte throughout South India. Of these names, 'Moriyara Mane' is of some interest. It is mentioned even in a 13th century inscription in the context of fixing it as a boundary mark for a land grant as e.g. the Ane Kannambadi copper plates (Nagaraja Rao, M.S. K.V. Ramesh 1985: 78) of Hoysala Narasimha (1219 A.D.) as follows: (line 118: "ranul Jemkalu Virabhadrana bana allim baralu" line 119: "Moriyara manegaḷu tuggila kolalanu"). The 'Moriyan Mane' actually Megalithic burial chambers found generally in hundreds in an open site on or at the foot of a hill, are believed to be the dwelling houses of a community called the 'Moriyas' who hailing from the north were presumably dwarfs in view of the size of chambers. Archaeological investigations into such chambers e.g. at Brahmagiri (Molakalmuru Tk., Chitradurga dist.) have revealed unambiguously that such stone chambers are evidently burials (AI No.4: 181-310). In Dakshina Kannada, similar Megalithic burial chambers are found in Bada Kajakaru discovered by Guru Raja Bhatt; at Kakkunje discovered by Vasantha Shetty. Now what is pertinent is their association with the Moriyas. Who are these Moriyas (generally taken to be the tabhava form of the word 'Maurya' of the north) But our people of the past in the medieval period were clear in using the names the 'Maurya' and the 'Moriya' in inscriptions (e.g. Pattadakal inscriptions of 1163 and *Singirājapurāṇa)*. One of them is the name of the Imperial dynasty and another, an unknown community to whom the chambers belonged. the Moriyas of the inscriptios do not seem to have anything to do with the Imperial Mauryas. Archaeologists have not been yet successful in identifying the community as the builders of such megaliths that is however said to be nomadic according to one school of thought. Hence the question of the Moriyas as one of the builders of Megaliths is still open.

In north western Karnataka, Megalithic passage chambers e.g. at Konnur (gokak Tk., Belgaum dist.) are locally believed to be for Jaina Munis' meditation during 'Chaturmasya' and after death they are believed to have been buried there. Actually these like the port-hole burial chambers in Brahmagiri etc. are also burials of common people of protohistoric period characterised by the use of iron; not of munis. The people at large, later, began to suppose that the chambers about which they were totally ignorant, contained treasure. They were, therefore plun-dered. Thus the chambers were emptied and later used occasionally by some Jaina Munis here and there as at Konnur for mediation. the chamhers in this way came to be known as 'Munivasa guhas'. Nevertheless the name to such sites helps in a small way in tracing the Jaina munis's settlements and their movements.

4. Names of regions forming another category needs to be examined. Since 1960 I had an occasion to examine several times Hampi rāgion traditionally believed to be 'Kishkindhā' of the *Rāmāyana*. Ahout 100 Km. south of Hampi is 'Jetinga Ramesvara' with a minor rock edict of Asoka, the Mauryan emperor (c. 273-234 B.C.), where Jaṭāyu is believed to have attacked Rāvaṇa abductiong Sītā, but fatally wounded. An inscription of 1076 from Devihal about 10 km away from Hampi refers to Hampi as Kishkindhā (Sundara 1988:101). There is another inscription of 1234 A.D. in Shirsangi referring to the geographical location of Kishkindha correctly. A 12th cent. inscription from Uchhangi refers to Hiḍambapura/vana of the *Mahābhārata* to its east coinciding with Chitradurga - Chandravalli site nearby. A large chunk of the western coast including Dakshina Kannada is known as "Paraśurāma Kśetra". I Have archaeologically examined some of the areas in all these regions. In this context I would recall the observation made by D.C.Sircar (1979:16) about our traditions and our attitude towards them from the point of history. According to him, these traditions containing what our ancestors said about the episodes of the *Rāmāyana* etc. are not of late origin. They are at least 1500 or 200 years old. Those people therefore are nearer in time to the period of these semi historical episodes than we. It is therefore necessary to understand their words and consider them. Indeed there is sense in Sircar's observation. My examination of the above mentioned places indicate that there is some substance in these names and the associated traditions. I Have discussed these traditions elsewhere.*

* Regarding Paraśurāma Ksetra: "Prehistoric and protohistoric cultures of Dakshiṇa Kannada". Perspectives on Dakshina Kannada and Kodagu (Mangalore University Decinnial Volume), Mangalore, 1991.
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** Recently Sri S.D. Shetty, had picked up a neolithic axe in the vicinity of Megaravalli, now in the collection of Manjusa Museum in Dharmasthala (Daksina Kannada). the axe which I have examined is triangular ovaloid in section, well ground, made on apparently doerite dyke.

The Parasurama Ksetra legend (Sundara 1991) referred to it in Mahakavi Kalidasa's *Raghuvaṁśā* of c. 4th A.D. and in Ptolemy's Geography (mentioning mountain "phurus"), appears to be at least 200 years old. Two main points in the sea receding from the Western Ghat area. Recent scientific investigations in the eastern and western coasts indicate that the coastal land all along was found to have been submerged in the sea at least twice around 30,000 years and 10,000 years before present . And Neolithic axes of pointed butt end variety have been sparingly found within last 2 years by Vasantha Shetty in the Sita valley region providing distant links with Neolithic sites in upghat area near Tirthahlli - Megaravalli** (Sundara 1969: 183-203) from where Parasurama is believed to have thrown his axe the most distinctive feature of the Neolithic culture that spread into the coastal land sometime after the exposure of the land.

Similaraly, Hampi and Jetinga Ramesvara have some archaeological evidences indicating that there is truth in the traditions of the places. To mention one or two points: of the Several rock-shelters and caves with paintings of humans and animals etc. in red ochre noticed by me (1987: 1-31) in different parts of North Karnataka some of the human depictions in Hampi-Anegondi area only are interesting. One or two in the groups are delineated as having tails.

These paintings are at least 3500-400 years old if not older. It is true they are shown in a ritual context in which people required to dress themselves and paint their bodies as per the ritual practices. Humans of such paintings in other places are without tails. Near Anegondi there is a mound of scoriaceaous ash at least 3000-3500 years old with neolithir and megalithic material remains. The mound is believed to be due to cremation of Vali the elder brother of Sugriva of the *Rāmāyaṇa*. In the midst of Megalithic burial chambers on the hill top in the revenue limits of Hire-Benakel, is a huge cut-out on granite slab of what looks like a bird. Is it a symbolic abstract representation of the mighty bird Jatayu? In relation to the place/regional names: Kiskindhā and Jatinga Ramesvara, I am of the opinion that people of these archaeological remains might probably have been the direct inheritors of the traditions in praise of the achievements and exploits of their own ancestors. Did they commemorate their men of eminence through paintings, huge figures, ritual burnings resulting in the formations scoriaceous ash mounds wherever they settled down during their movements from their ancestral homes? This incidentally explains the occurrence of more than one place with names e.g. virata or Ekachakrānagara and

locations of the places of the episodes not in any order as given in the concerned poetic narrative compositions or ballads.

The actual incidents of the episodes in this way seem to be quite old about 5000 years. What is the picture of the every day life of the people of the time of the incidents archaeologically? We find that the people in the Mesolithic stage and using pigmy tools meassuring 1 cm. to 5 cm. or 6 cm. long and 3 to 5 mm. wide on stone without the knowledge of any metal as known from the Mesolithic sites in Sanganakal (Sankalia 1969) or the Neolithic sites e.g. Tekkalakot (Nagaraja Rao 1965) in Shiraguppa Tk,Bellary Dist. in Hampi region in utter contrast to the glorious picture of the people, society, sublime thoughts and values in poetic narratives of the episodes. It would have been well-nigh impossible to co-ordinate and co-relate the literary, the traditional accounts and archaeological evedences, had there not been discoveries of Mesolithic sites of the types in the Belan valley (Allahabad Dist.) representing a society distinctly advanced around 5000 B.C. highly urbanised Neolithic society of 5000-3000 B.C. at Mehargarh (Shashi Asthana 1985: 110-120) near the Indus Valley and the glorious Harappan cities of 2500-2000 B.C. In Harappa, Mohenjadaro (Pakistan) Lothal with earliest dock-yard in the world (Sagarwala Dist. Gujarat) and recently in Dhola vira (Cutch Dist.) with three-unit city having stately gateways with single line inscription in large size and highly polished stone pillars (Bisht, R.S. 1989-90: 71-82) in no way inferior to that of the interior walls of the Buddhist Viharas, in Barabar hills (Bihar) and of the pillars of the Mauryan period.

In our region, in Hattiangadi (kundapur Tk.) there is a place, known by the unusual name "Aramane dibba" (Place on the eminence). during my explorations here around 1975 (1990: 39-44) was revealed an ancient habitation site with remains of some brick structures of 1st-2nd century. A.D. on the elevated ground and also down below habitational material remains of about 2 m. deep from the surface exposed in the water-well just then dug as well as Śiva-linga brick shrines near the present Lokanatheśvara temple. the Portuguese drawing of this place (provided by my friend Vasanta Madhava) shows that there was a wide sea inlet on the bank of which was Hattiangadi allowing big merchandise boats. the place must have been commercially very active and prosperous through maritime trade even from before the beginning of the Christian era, controlled by administration and hence "Aramane Dibba" recalling the two unit layout of Harappan civilization. Northwards in Haigunda (Uttara Kannada) meaning an eminent land in water a hilly site in the midst of Saravati about 20 km. from Honnavara, is a similar site with a colossal sculpture of Yakśa of 2nd century two Buddha sculptures of 5th century etc. all noticed by me then (1979:164-170). All these suggest gradual percolation of cultural milieu.

The Vedas are the earliest known non-sectarian literary and religious document in the history of the world c. 2000 B.C.they are really or more impregnated with the most sublime fundamental spiritual and metaphysical thoughts and values of life besides popular beliefs and practices coming down from the Prehistoric times.

A poet of the order of Valmiki or Vyasa therefore could certainly find necessary inspiration and materials for the gorgeous description of the cities and for the enunciation of the values of life through the episodes, around 2000 B.C.

4. There is yet another category of place-names: places having different names in different ages. For instance, an inscription from Uchchangidurga (Harapanahalli Tk., Bellary Dist. SII, Vol. 9, No. 571) states that the place was known by the name 'Meghanāda' another name for Ghatotkacha in Kritayuga; 'Kanakagiri' in the Treta by reason of its being the abode of Hiranya in whose times there was shower of gold ("Suvarnavriste"); Uttunga Mahagiri in the Dvapara and Unhchangiparvata because of a brahmana lady Uchchangiyabbe (who in turn must have been named after the traditional name of the place) attaining divinehood (devatvaṁ). Similarly the Kallurugudda (near Mandali a suburb of Shimoga city) inscription of 11th century in the vicinity of Shiimoga city speaks of the place as Mahendrapura Madanpura, Mandalapura and Mandali respectively in these four yugas (EC vol. VIII, No.) Is stating the place as having different names in different yugas only to emphasise its antiquity and to glorify it on the part of the composer of the text of inscription as desired by the donor or patron? Or is it a poetic recounting of the prevalent local tradition of the place? It looks as though the latter is possibly affirmative, since there appears to be consistency in such recountings given in more than one inscription as for instance mention of Hidambapura in another inscription of the same period from Uchchangi. Such set of names of the places cannot be set aside as mere poetic fancy in every case and therefore need due consideration. My explorations in Mandali-Gudde Maradi (now know as Śivagiri) on the opposite banks of the Tunga river in Shimoga has clearly relealed three cultural stages of the people of the past immediately preceding Mandali of 4th cent. A.D. mentioned in the inscription: traces of the Neolithic (c. 1800-800 B.C.), the Iron Age Megalithic

(c.1000-200 B.C.) and the Early Historical (c.3rd cemt.B.C.-3rd Cent. A.D.) singficantly at the foot of a granite hill in Guddey maradi (now śivagiri) having some sanctity with a Śiva (Mallikārjuna) temple in the late medieval period referred to in the inscriptions of the Vijayanagara period of that area and the last near kalluragudda. Was Śivagiri then known as Mahendragiri and hence the nearby human settlement as Mahendrapura? In view of the progressive material cultural development from the Neolithic to the Early historical on the one hand and of the highest sublime spiritual attainments already at a time contemporaneous with the neolithic and becoming a fountain head for the development of different systems of spiritual and metaphysical thinking in the subsequent periods, should the four yugas in our history too be taken as successive stages of the spiritual and moral progress for right interpretation of the place names in epigraphs, literature or unrecorded local legends?

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Jain Vestiges at Penukonda Fort

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Penukonda a well known hill fort of the Vijayanagara times has two Jain temples, namely, the Ajitantha temple and the Pārśvanātha temple, standing as the witnesses of the flourishing state of jainism in the region during medieval times. The palce is also claimed as one of the eighteen seats of Jainism in the country. Rayalasim, because of its close association with the Karnataka country both historically and geographically, had the impact of Jainism since early times. A number of Jain temples are noticed in the region at different places. In some of them worship is still being continued by the lonely jain families staying at the places as priests.

Penukonda, situated at latitude 14°5' N and longitude 77°36' E, is the head-quarters of a mandalam of the same name in the present Anantapur district of Andhra Pradesh. It is a Railway station on the Guntakal-Bangalore railway line at a distance of 39 km from dharmavaram railway junction. It is at a distance of 71 km from Anantapur on the Kurnool-Bangalore highway.

Penukonda, meaning big hill, is referred to in the inscriptions as Suragiri, Chanagiri, Chanadri etc (EC IV. 58; ARE/923,1920). The Penukonnda fort was built on one of the separated hills in the hill range named after Penukonda itself. The fortified Penukonda hill is about 3000' high above the mean sea level.

Historical background

Though the region has historic importance since the time of Imperial Mauryas, Penukonda came to limelight during the last years of the Hoysala rule. Penukonda was the headquarter of a governor under Hoysala king Ballala III (Dncan and Derret 1957: 140-59). The establishment of vijayanagara empire by Harihara and Bukka on the southern banks of the river Tungabhadra in the year A.D. 1336 had far reaching consequences in the history of Penukonda. When Harihara became king of Vijayanagar, his brother Bukka I was coronated as the crown prince and kept inchrge of gooty fortress. Soon Bukka I annexed the Fortress of Penukonda to which he shifted his headquarter (Sastri 1976: 240). The acquisition of Penukonda was a strategic measure resulting in the annexation of the Hoysala kingdom to Vijayanagara in A.d. 1346. In A.D. 1357 Harihara was succeeded by his brother Bukka I. Hew appointed his sons as governors of the provinces. Virupanna was made the governor of Penukonda (Venkataramanayya 1976: 15-18; ARE 1906).

Penukonda continued as the headquarter of an important province of that name under the sucessive Vijayanagara rulers until the middle of the seventeenth century A.D. After sthe battle of Rakshasi Tangadi in A.D. 1565, Penukonda was made the capital of the Vijayanagara kingdom for about two decades. Penukonda was thereafter ruled by governors until it came under muslim rulers.

Tradition claims that the fort of Penukonda was founded by Kriyaktiudaiyar. The fortification of Pennukonda began under the leadership of Bukka I and his son Virupanna soon after its occupation. Penukonda recieved much attention during the reign of Bukka I. Virupanna, the governor of Penukonda province, under the able guidance of Anantarasa Chikka Vodeya, planned and fortified the Penukonda town (Sastri 1976: 256). The fort was strengthened by many additions during the 16th and 17th centuries. The fort of Penkonda is in two stages, the lower one at the foot of the hill and upper one on the top of the hill. Within the lower fort, there are many Hindu temples, one Jumma majid two Jain temples, Gagan mahal (Royal palace) etc.

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Of the two Jain temples, the Pārśvanātha temple is located in the main street within the fort and to the north of the Jumma majid. The second one namely the Ajitanātha temple is situated to the east of the Gagan mahal and to the north-east of the gopur agateway.

History of Jainism at Penukonda

The earliest reference to the Jains at Penukonda was made in an inscription of the reign of Bukka I discovered at Kalya in Madagi taluk of Bangalore district (Gopal 1985: 211). The epigraph refers to Jains of Penukonda who were among the petitioners to the king Bukka against the harassment caused by the Śrivaisavas. This the epigraph of Kalya forms and important evidence about the people of different faiths and sects living at Penukonda and the conflicts among them.

There is no refernce to the construction of the Jain temples at Penukonda. However, it may be presumed that the Jains who are mostly of merchant class migrated to this town during the reign of Vira Ballala III and settled at the place. As the importance of Penukonda grew under Harihara I and Bukka I the strength of the Jains should have grown numerically as a result of which two jain temples were built at Penukonda.

The Ajitanātha Temple

The Ajitanatha temple, located to the north-east of the tall *gopura*-gateway standing in isolation and to the east of the *Gangan mahal,* is a north facing Jain temple. the temple has neither foundational nor endowment references in the inscriptions. the temple, on plan, consists of a *garbhgriha*, an *antarāla* and a mukhamandapa having two doorways. The two doorways have *mukha-chatushkis* or porches infront. The whole temple is surrounded by a dilapidated *prākārā* with a *gopura-dvāra* in the north.

The Gopura dvāra.

The *prākāra,* which provided a rectangular courtyard north-south for the temple, is in ruins. In the middle of the north *Prākāra* wall there is one *dvāra-dvara* of which the superstructure is not extant. The gopura-dvāra is simple and of smaller variety, and probably bore a superstructure of a single storey unlike other *gopura-gateways* at the place. As its *adhishthāna* is covered with new extensions its mouldings could not be identified. The walls are plain and the verticals on either side of the gateway have Dvārapālaka figures on their lower portions. The Dvārapālakas resemble the Śaivite Dvārapālas holding club with one of the lower arms and another lower hand in *tarjanī* pose. the objects in the upper hands look like lotuses.

The Mukhamndapa

The main temple in the court-yard consists of a *garbha-griha,* an antarāla and a mukhamandapa. All these members are raised on a common *upapīṭha* having the mouldings from bottom upwards - *upana, jagati, gala* and *paṭṭa*. The *upapītha* does not provide any additional platform aroun the temple to serve as open *pradakshiāṇapatha.* The *adhishṭhāna* just above the *upapīṭha* has common mouldings. *Upana, patta, tripaṭṭakumuda, galapada* and *patta* are the members of the *adhishṭhana* form bottom upwards.

The *mukhamaṇḍapa*, a square structure, is a closed on with two *dvaras* one in the north and the second in the east. Infornt of the north *dvāra* there is a *maṇḍapa* standing on four pillars. Each pillar of this *maṇḍapa* consists of two square blocks, with an octagonal section in between, *kalasa*, circular disc like cushion, *idal* and *phalaka*. the capitals above the pillars have chola corbels. On the faces of the square blocks, the figures of Jain Tirthankaras and decorative motifs are scupltured. On the either side of the flight of steps leading to the *maṇḍapa,* there are parapets topped by element heads with their trunks.

The *mukha chatushkī* infront of the eastern doorway of the *mukhamaṇḍapa* has four pillars. The front two pillars are of *chitrakhanda* variety. each pillar consists of three square blocks with two octagonal sections in between. The capitals above the pillars have the corbels with angular tenon like projections of the chola order. The pillars are decorated with the figures of seated *sardulas*, Tirthankaras etc. The flight of steps leading to the doorway of the *mukhamaṇḍapa* is flanked by parapets topped by simhamukhas with trunks emanating from their mouths.

The *mukhamaṇḍapa* is a square structure having sixteen pillars and two doorways. the walls of the *maṇḍapa* are plain. The central four pillars are of the chitrakhanda variety. Each pillar consists of two square blocks with an octagonal section in between, *kalasa*, circular disc, *padma* and *phalaka*. The capitals above have chola corbels. The ceiling of the *maṇḍapa* in between the central four pillars is arranged in an *ashṭakoṇa* design with a lotus medallaion in the centre. The pillars abutting the walls are plain square shafts. On the faces of the square blocks of the

central four pillars, the figures of Tirthankaras, aeated *ūardals* etc., were beautifully sculptured. There are two raised platforms in the south-east and south-west portions of the *mukhamaṇḍapa*. On these platforms a beautiful image of Saraswatī and the image of Pārśvanātha are placed. The north doorway of the *mukha-maṇḍapa* is of *triśākhā* variety with *latā,ratna* and *padma* ornamentation. On the bottom portions of the door jambs two dwārapālaka figures are sculptured. they are shown standing in *vyatyastapāda* pose and each has four arms. In the two lower hands they carry *gadā* and *dhanusa*,and the upper two arms hold lotus flowers. An image of Tīrthankara seated in *padmāsana* and flanked by two *apsarās* is represented in the lintel portion. The door jambs of the eastern entrance are of single section decorated with *padma* and *latā* motifs. The dvārapālakas, represented on the lower portions of the door jambs, are similar to those sculptured on the door jambs of the northern entrnance. They are shown wearing *kirīṭamukuṭa*, garlands going down upto their knees, *yajnopavita* and *pūrṇoruka*. In the lintel portion, a Tīrthankara (Ajitanātha) is represented in seated form. Two elephants standing on either side of the central figure of Ajitanātha, are shown offering garlands with their raised trunks (proboscis). This panel resembles the Gajalakshmī motif of the Hindu temples.

The Main shrine

The main shrine consists of an *antarāla* and a *garbhagriha*. The walls of the *antarāla* are plain. The door jambs of the *dāvara* of the *antarāla* are decorated with *latā* motif emanating from the *makara mukhas* at the bottom and *padma*. On their bottom portions two dvārapālakas are represented standing cross-legged in *vyatyastapāda* pose. They hold bow, club and lotus flowers in their four arms. The image of Tīrthankara (Pārśvanatha) is shown seated in *padmāsana* pose under a Nāga hood. On either side of the image two *makaras* with their plumes are represented.

The *upapīṭha* and the *adhishṭhāna* mouldings of the antarāla and *garbhagriha* is a square structure. The walls of the *garbhagriha* are plain. The *kapota* above the wall portion is decorated with *simhalaāṭa* gables having human heads inside. Above the *kapota* of the temple a dwarfish parapet crowned by a row of arches was built at a later date. The doorway of the *garbhagriha* is a single jambed variety decorated with a *latā* and *padma* motifs. The *pūrṇa kalaśa* motifs are represented on the lower portions of the door jambs instead of the figures of dvārapālakas. The lintel portion is adorned with a lotus flower design. the ceiling of the *garbhagriha* is arranged in an *ashṭakoṇa* with a lotus medalllion in the centre. The original presiding deity of this shrine was a bronze image of Ajitanātha. It was displaced in a burglary in recent years. Ater this unhappy event the temple became non functional and deserted. At present the *garbhagriha* houses an image of Ajitanātha in seated posture which is of stone. The suprestructure above the *garbhagriha* is a brick built square sturcture with arched niches on the four sides which seem to have housed the figures of Tīrthankars. The *śikhara* above is a circular one, topped by an inverted lotus shped structure. the *kalaśa* above is missing.

The Temple of Pārśvanātha

The Pārśvanātha temple located in the main street of the fort is just adjacent to the north of *Jumma masjid*. This is a living temple. The only family belonging to the *digambara* sect of Penukonda performs worship in the Pārśvanātha temple which has undergone alterations and renovations many a time. Due to lack of any epigraphical references to this temple, it is difficult to date the foundation of this temple.

The temple,facing east on plan consists of a *garbhagriha*, an *antarala* and a *mukhamaṇḍapa*. The temple is surrounded bu a *prākāra* built during recent times. The *gopura*-gateway was not planned for this temple. The *mukhamaṇḍapa*, being a closed one, has two *dvāras* one in the south wall and the other in the east. The southern *dvāra* has a *mukhachatushī* infront having four pillars in a row. The pillars are of the *chitrakhanda* variety having two square sections with an octagonal section in between and a *kalasa* above. The capitals have lotus corbels. This *mukhachatushkī* seems to have been added at a leter date. The *dvaraśākhās* of *mukhamaṇḍapa* are very simple with a creeper design. Within the *mukhamandapa* there are two subshrines housing the images of Pārsvanātha and his *Yakshiṇī* or *Śīsanadevatā*, Padmāvatī.

The walls of the mukhamaṇḍapa are plain. The *mukhamaṇḍapa* has sixteen pillars. The pillars are of *chitrakhanda* variety with capitals having chola corbels. The ceilling in between the central four pillars is arranged in an *ashṭakoṇa* design with a lotus madallion in the centre.

The *adhishṭhāna* of the *garbhagriha* and is almost buried underground and its mouldings seen above the ground level are - *tripaṭṭa kumuda, galapada* and *ālingapaṭṭikā*. The walls of both the *antarāla* and *garbhagriha* are plain. In the *prastara* region, the *kapota*

is adorned with *simhalalāṭa* gables with human heads inside. The *garbhagriha* is a square structure with a *vimana* of the ekatala variety, having *kuta, panjara* and *sala* series and crowned by a round *griva* and *śikhara*. A bronze *kalśa* was installed over the *śikhara*. On the four faces of the *vimāna* the images of Tīrthankaras made of stucco are arranged at two stages. The door jambs of the *antarāla* and *garbhagriha* are simple with *latā* and *padma* decorations. This is a nude image shown standing in *kayotsarga mudrā* under the hoood of a serpent. The body of the serpent is represented in coils behind.

Sculptural art and Jain Iconography

The sculptural art of the two Jain temples represents the Vijayanagara art features in form and style.Decorative motifs, mythical animal figures, Jain pantheon etc., are found mostly on the pillars, door jambs, central ceilings etc. The *adhishṭhāna* and *kudya* portions are devoid of any sculptural art.

The *latā* or meandering creepers, *ratna* and padma motifs are found prominently on the door jambs of the Ajitanatha temple, where as the door jambs of the Pāśvanātha temple are very simple with *padma* and creeper motifs. The ornamentation of the door jambs with decorative motifs, dvārapālakas and Jain figures in the lintel are very interesting. The dvārapālaka figures both in form and style resemble the dvārapālaka figures of the Hindu temples except the attributes held in their hands. The dvārapālaka figures sculptured on the lower portions of the door jambs of the Ajitanātha temple are shown standing in *vytyastapāda* pose and bedecked with several ornaments like *kiriṭuamākuṭa*, *keyūras*, *kuṇḍalas*, *hāras*, *purṇorukha* etc. The attributes held by them are *gadā*, *dhanus* and *padma*. The doorway of the *garbhagriha* is decorated with *purṇakalaśa* in place of dvārapālaka figures and *padma* in the lintel. The lintel or the *lalāṭabimba* of the north doorway of the *mukhamaṇḍapa*of the Ajitanātha temple is sculptured wiht an image of Tīrthankara, probabaly Ajitanātha. Here, Ajitanātha is shown seated in *padmāsana* flanked by two *apsarās*. The two *apsarās* here may be representing his attendants Mahayaksha and Rohiṇi. In the same temple another sculpture of Ajitanātha is depicted in the lintel of the east door way of the *mukhamaṇḍapa*. The Tīrthankara is shown seated in *padmāsana* flanked by two elephants holding garlands with their raised proboscis. This resemble the Gajalakshmī motif of the Hindu temples.

The doorway of the *antarāla* consists of the iamgc of Pārśvanaāha in its lintel, shown seated in *padmāsana* with a five hooded Naga over head. The image is flanked by two *makaras*. The parapets crowned by *vyālas* on either side of the flight of steps, seated *śārdūlas* depicted on the pillars are the other sculptures found in the Ajitanātha temple.

Pārśvanātha

Pārśvanaātha, the twenty third Tīrthankara of the Jain pantheon, is represented in two life size images at Penukonda, one forund in the *mukhamaṇḍapa* of the Ajitanātha temple and the second in the *garbhagriha* of the Pārśvanātha themple. Pārśvanātha is considered as a historical figure. Both the jain sects describe that Pārśvanātha was dark blue in complexion and had the serpent as his cognizance. The serpent may represent five or seven snake hooods over his head. Its body is often coiling behind the body of Jina with its hoods raised above his head like a canopy. The coiling serpent and its hoods represent Dharaṇa Nāga protecting the body of Pārśvanātha. Pārśvanātha is associated with Dharaṇendra and padmāvatī. Padmāvatī is his *Śāsanadevatā* or attendant *Yakshī* protecting the samgha of Pārśvanātha (Shah 1987: 170-72).

The image found in the Ajitanātha temple is very interesting (PL. IXX). It is a tall life size image of Pārśvanatha with a *Prabhāmaṇḍala* behind, all sculptured out of a single dolerite stone. Pārśvanātha, standing in *kayotsargamudrā*, is depicted nude. The polished surface of the body depicts the nudity of the image more effectively. The long hands, wide chest etc., represent the *mahāpurushalakshaṇas* whereas the bulging hip portion and tapering thighs resemble the physique of a female figure. The image has a round and youthful countanance with big and prominent eyes and the hair arranged in curly fashion. Behind the head, a halo is represented. The serpent or Dharaṇendra is shown coiling behind the image with its seven hoods raised above the head of the Jina like a canopy, above this Nāga hood a stupa like *chowrī* is represented. On either side of the image and at its shoulder level, two *chāmaras* are represented symbolically. On the lower portion and on either side of the legs of Pārśvanātha, the figures of Dharanendra and Padmāvatī are depicted in human form.

Dharaṇendra, standing in *dvibhanga* near the right leg of the Jina, is bedecked in a royal dress and ornaments. He is crowned by a Nāga hood having three heads. He has four arms, holding noose and *padma* in the upper arms while the lower hands are kept in *abhaya* and *varada mudras*. Padmāvatī, standing in *dvibhanga* near the left leg of Pārśvanātha, is crowned by a single Nāga hood.

She has four arms and holds noose and lotus in the upper hands and keeps the lower two in *abhaya* and varda poses.

The second image (PL.XX) of Pārśvanātha found in the Pārśvanātha temple is indentical with the above description. This is more polished image and looks later than the first one. The Jina looks youthful and a *ushṇisha* is arranged above his head. The two *chāmaras*, seven hooded Nāga behind, Dharaṇendra and Padmāvatī on ether side at the bottom are executed well in this example also.

Sarasvatī

A large number of Hindu gods and goddesses had been incorporated into the Buddhist and Jain panteons. Sarasvatī, the goddess of learning and wisdom, also found her place in the Buddhist and Jain pantheon. Sarasvatī found her place in Jain literature and art. She is regarded as the superintending deity of knowledge and learning by Jains. In the Jaina literature she is invoked in several forms. The well known three forms are two-armed, four armed and nulti-armed varities. Her attributes are pustaka, kamala, *akshamāla, vinā,* haïnsa etc (Ghosh 1984: 78-86). Different forms of the goddess are notice in Jaina art throughout India sicnce the time of the Kushanas (Ghosh 1984: 90-97).

A beautiful image of Srasvati s noticed at Penukonda testifying the popularity the Goddess of learning and knowledge among jains. This four armed image of Sarasvatī is sech in the *mukhamaṇḍapa* of the Ajitanātha temple. She is shown seated in *lalitāsana* on a *padmapītha*. This beautiful image having a round face, broad eyes, heavy breast, slender waist, long legs., is bedecked with *kirīṭamākuta, chakrakundalas*, necklace, *haras*, *kuchabandha*, girdle, *kaṭivalaya*, *kinkiṇis* and *padavalayas*. The folds of her lower garment spread ornately in between her legs. She keeps her lower right hand in *chinmudrā* or *abhaya* with an *akshamālā* and holds a pustaka in the lower left, noose in the upper left and *padma* in the upper right. The *haṁsa* or the swan is represented on the pedestal or *pīṭha* below her legs. A *prabhāmaṇḍala* behind with a *siṁhamukha* at its apex adds beauty to this image. This is an interesting example of Sarasvatī of the Jain pantheon.

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Restoration of Angkor Vat (Cambodia): Indian Crusade

B. NARASIMHAIAH

The history and architectural style of the Angkor Vat temple-complex, built by king Sūryavarman II, during the early twelfth century AD, are well known. Angkor Vat is undoubtedly a culmination point in the evolution of Khmer Art and Architecture, expressing a harmonious blend of massiveness, monumentality and artistic details. Architecturally, it is a terraced temple representing the Meru concept, the rudimentary forms of which are found in the Indian sub-continent at Ahichchatra, Sarnath and Paharpur datable to fifth and sixth century AD onwards. On plan, a quadrangle, it is built over four ascending but diminishing man-made terraces of heaped up earth retrieved from the digging of moat all around, bound by enclosures with massive plinths. The main shrine with lofty tower is majestically located at the centre of the enclosure with towers at four corners, on the topmost terrace. The second enclosure is also provided with towers at four corners. Thus, the temple complex with cluster of well disposed enclosures and towers surrounded by moat sprawling over an area of nearly one kilometre square, is unique for its bold conception and creative genius. In addition, its greatest artistic treasures are exemplified by its intricately carved reliefs depicting episodes from the Rāmāyaṇa, the Mahābhārata, Purāṇas and historical expedition of king sūryavarman II and above all sensuous *apsaras*.

Such a magnificent edifice built of the coarse grained sandstone of different hues was in ruins due to centuries of neglect and the vagaries of nature, till it was rediscovered in the middle of the nineteenth century. Since then efforts were being made to save the monument from further decay and destruction by the Conservation De Angkor. However, the French experts had to leave the country around 1970 before they could attempt conservation work of serious nature. Once again, the temple complex fell under negligence and was silently crying for international attention.

In early 1980, the Government of Cambodia made a fervent appeal to the international community to save the Angkor Vat complex for posterity. The Government of India, obviously because of the traditional and historical bond between the two countries, responded favourably with concern and decided to take up conservation work, and sent a team of experts from the Archaeological Survey of India in November, 1980 itself. Subsequently, another team was sent in 1982 to make a detailed study of the works to be taken up. However, after a bilateral agreement between Indian and Cambodian Governments cooperation and committed work is being carried out.

This great temple comlex of Angkor Vat, an architectural marvel, originally dedicated to the Hindu god Vishṇu had suffered due to various reasons like: heavy tropical Vegetational growth over the monument; errors in original construction; collapsed or dismantled (by previous conservators) portions to be reconstructed; vagaries of nature and negligence for centuries; human vandalism; menace of birds and bats; cryptogamaic growths such as moss, lichen and algae, etc., all acting either individually or cumulatively.

Since 1986, the Indian teams from the Archaeological Survey of India have been successful in solving conservaton problems on the monument and have carried out work with meticulous care, keeping in view the basic requirements and principles like: immediate and effective measures to avert the process of deterioration; consolidation and preservation to the maximum extent, wherever necessary, of all the original portions of the monument as per the original scheme of construction; and ensuring

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Archaeological Survey of India, Madras.

minimal intervention while conserving to provide required stability to the monument. Some of the outstanding works carried out are given below.

A general phenomenon observed in the galleries of the third enclosure of the monument is that all the outer pillars of the galleries with semi-vaulted roof are leaning out, and due to this the tie- beams are supposed to have sheared and the so-called cracks have widened. This phenomenon is generally attributed either to the failure of foundation or to the sinking of the main pillars of the main gallery. However, our study has shown that this phenomenon is only due to an engineering error committed during the original construction. Further, the shearing or cracks in the tie-beams are not actually cracks, but each beam is made of two parts - one projecting part of the main pillar, and the other resting over the outer pillar, but connected to the projected part. Therefore, the crack is nothing but a joint between the two parts.

Regarding the settlement of foundation, there is no evidence of sinking or disturbance of any architectural member of the plinth. The settlement or sinking of main pillars of the main gallery cannot be accepted as there is no evidence. For example, the architectural members resting over the main pillar do not show any sign of buckling or widening of joints. They are in perfect original horizontal level with paper thin joints. However, the horizontal level on the whole at the top of the main pillars shows little sagging at the centre of the gallery, which is also repeated in the original flooring. Therefore, the height from the floor level to the horizontal level above the main pillar is same at any given point in the gallery. Thus, it can be concluded that this error had crept in the original construction itself. But the horizontal level at the top of the outer pillars is in perfect straight line. Furthermore, the stones of the topmost course of the roof of the semi-vaulted roof of the verandah are socketed into a groove cut in the main beams of the main gallery.

The ultimate result of these errors was that the thrust of the semi-vaulted roof, which is obviously towards exterior, could very easily dislodge the joint and push the outer pillars out of plumb. Oviously, if the tie-beams were to be made of single stones and horizontal levels at the top of the main pillars and the outer pillars were to be at the same height, this phenomenon would not have occurred. Therefore, the remedy is very simple: make tie-beam to act like one for which it was provided and bring back the outer pillars to their original plumb and maintain the horizontal level of the tie-beams.

Western wing gallery on northern side of third enclosure was the most affected one in the whole complex. Here, the joints of the tie-beams had widened by 4 to 5cm and the outer pillars had gone of plumb by 2 to 3 cm. As a precautionary measure, buttresses had been provided from outside to the leaning pillars, and iron belts had been given between outer pillar and the main pillar, by the earlier conservators sometime ago. But these precautionary measures were not only giving ugly look, but also they had blocked easy access to the gallery. Therefore, this gallery which was in precarious condition was taken up for conservation.

In the first instance, strong suitable supports were given from inside to the upper courses of the semi-vaulted roof and tie-beam, and then the courses immediately over the outer horizonatal beams were dismantled. The beams thus freed were jacked up and the pillar which became free of any load was brought to its original plumb. The beams were reset over it in their proper positions. Ultimately, the tie-beam was reset in its perfect horizontal position after applying epoxy resin between the two parts of the tie-beam. In addition, to arrest the recurrence of the phenomenon in any form, steel dowels were provided between the parts of the tie-beam, between outer beams and tie-beam and between two outer beams. Thus, all the architectural members including the main pillar share the thrust of the roof, as they are interconnected and act like one block. It is needless to say that all the props, buttresses and iron belts have been removed, and now the gallery has free access, and above all, it is thoroughly conserved (Pls. XXI-XXII). Likewise, eastern wing gallery on northern side and northern wing gallery on eastern side of third enclosure were also conserved.

Vegetational growth over the monument is the most dangerous enemy of any monument, especially in the tropical climate. This monument was not an exception. Obviously, the vegetational growth over the structures had played damaging part in dislodging the architectural members and widening the joints in the masonry. Due to this, rain water was freely entering into the masonry and the core of the structures, and it was accelerating the process of weathering of stone members, besides affecting the core. The most affected structures, however, were the towers, stepped entrances, porches, etc.

For example, in the south-western corner tower of the second enclosure, vegetation had grown very freely over it, and the roots had penetrated through the walls and were hanging inside the structure. The removal of the vegetational growth was itself a great task. After clearing the vegetational growth, the dislodged stones were reset in their proper position. And then, grouting and pointing was done. Extreme care was taken to fill up all the crevices

and holes in the masonry so that no vegetation grows once again over the structure. The opening at the top of the tower due to missing of the members, through which the rain water was pouring down into the structure was sealed by providing RCC slabs. The weathered architectural members, the ones supporting the members with cantilever action were strengthened by providing steel rods.

Likewise, all the five towers including the central one which is more than 29 m in height and all the stepped entrances on the eastern and southern sides of the second enclosure were also conserved. However, in some where the dislodgement of the members were pronounced, the portions were dismantled and reset as per the original.

But, in the case of entrance porches on the exteior southern side and interior eastern side of the third enclosure, they had to be dismantled and reconstructed, as the architectural members were not only dislodged but some of the important supporting members had broken into several pieces. Therefore, these porches were dismantled and after mending and strengthening the damaged architectural members like pillars. beams, etc., they were reconstructed as per the original.

The stepped embankment of the moat is in dilapidated condition due to dislodgement of its architectural members. Here, even the strong foundation given by the builders has been dislodged. In the first instance, the trees growing over the structure widened the joints of the masonry. Then the rain water gushing through these gaps started eroding the core materials. Due to this, it was easy for the trees to dislodge the stones further. The roots could penetrate quickly into the foundation and the foundation was also dislodged and eroded. Finally, the structure collapsed.

In the process of reconstruction, the architectural members of the dilapidated embankment were carefully dismantled, after meticulous documentation. Then, the original cuttings in stepped manner were cleared of all loose earth, debris and vegetational growth until hard stratum was struck. Over this stratum, a concrete bed was provided, over wich the core of laterite block was laid, and then the steps were constructed as per the original. Care was taken not to leave any gaps in between the blocks. Further, the space between the steps and the cutting was also filled with cement concrete so that the whole stretch of structure becomes one unit and would not be easy to dislodge. Thus, the eastern embankment north of the causeway was reconstructed upto a length of 120 m.

The famous Samudramanthan gallery and the flanking entrance pavilions on the eastern side of the third enclosure had been dismantled (by the Angkor De Conservation). Especially the gallery and the southern entrance pavilion had been completely dismantled, whereas the northern one up to a certain height. Further, it had reconstructed upto plinth level the two former structures. The reason for dismantling the structures is not known. However, more than 2500 architectural members of these three structures were lying on the ground under open sky. Due to this, they were weathering fast, and above all the Samudramanthan panel running to a length of 50 m was fully exposed to the vagaries of nature since 1970 in which year the French experts who were supervising the work had to leave the country.

Before taking up reconstruction work, some of the problems facing the work had to be solved. For example, we had to understand the system of numbering the dismantled members. Once they were understood,the reconstruction was easy. However, in the northern entrance pavilion, it was observed that the extant walls, door-frame and lintel were out of plumb. In addition, there was difference of level in the extant walls and discrepancy in diagonal mesurements of the structure. Therefore, it had to be further dismantled and reconstructed to rectify all the errors. Then the structures were further reconstructed with the available stacked stone members. After reconstructing the structures, the dismantled stones of the flooring were reset and the flooring was reconditioned

The southern central entrance porch of second enclosure had collapsed long ago, and all the architectural members were lying in a heap. Due to this, the entrance was inaccessible to the visitors. In addition, it was an eye-sore as the debris had not been cleared from the site.

As a preliminary step, all the architectural members were identified, removed and neatly stacked after proper documentation. Then the site was cleared of debris. However, while shifting the architectural members, it was found that some of the members like pillars, beams, roof stones, etc., had been damaged. Among the broken members, one of the pillars which was in two pieces was thoroughly mended and made fit for reuse. Another pillar was not in a condition to be mended fully for reusing it. Therefore, the major portion of the original pillar which was in good condition was taken and the missing portion was cast in RCC, and thus made fit for reuse. In addition, the front and side beams which had broken into two and three pieces respectively, were also mended and strengthened by providing concealed I-section girders. Besides, eight roof members which had broken were also suitably mended.

After reconditioning the floor which had been crushed and dislodged due to the collapsing of heavy superstructure over it, the four pillars including the mended ones were erected, and then the beams were hoisted to their original position. Then the available members of the vaulted roof were hauled up to their proper position. Altogether forty-six architectural members which had been retrieved from the debris were reused in the reconstruction of this porch. It can be noted here that hauling up and resetting the architectural members at a height between 6.2 m and 13.2 m from the ground level, only with the help of chain pulley blocks and human effort could be achieved with certain amount of difficulty.

In addition, the flight of steps flanked by massive balustrades representing double plinth of the enclosure of this entrance was also conserved. It was in dilapidated condition due to very heavy growth of vegetation. Some of the stone members had been dislodged and some had been thrown down and joints in the masonry had widened. The dislodged stones were reset in their proper position very carefully by using horizontal jacks and man power, without causing any damage to the members. The fallen members were hauled up and fixed in their position in the landings and balustrades. For the purpose of lifting heavy stones special type of scaffolding had to be constructed for using pulley blocks. The structure thus conserved was thoroughly watertightened by grouting and pointing, so that no vegetation grows over it in future.

The conservation of the southern library between third and fourth enclosures was of altogether different nature. It may be recalled here that certain portions of this structure had been dismantled very long ago, and the members had been stacked at a distance from it. Unfortunately, they had not been numbered. Further, there was no indication for their original position in the structure when we started to identify the members which could be reset in their original position. It was found that some of the members were missing only due to human vandalism. For example, the stones of the upper courses of certain area were available, whereas, of the lower courses were missing. But we decided to put back the available original architectural members in their place in the structure with a view: (1) to avoid further decay of the members lying under the open sky on the ground, and (ii) to provide roof over the structure where rain water was pouring into it. This difficult situation was overcome by providing suitable laterite blocks for the missing courses up to the bottom level of the upper courses for which the original stones were available. The laterite blocks used in the construction have been plastered in suitable colour in view of aesthetic value. Thus, all the available architectural members of this structure have been reused in the reconstruction. It can be mentioned here that more than forty-five laterite blocks have been used for resetting more than eighty original stone members. It is unfortunate that inspite of our best efforts, more than fifty members and pieces which could not be identified are still lying near the monument.

It is not surprising that the entire temple complex has become the abode of bats and birds due to long negligence. The excreta, especiallly of bats, is not only spreading pungent smell, but also affecting the stone surface. Therefore, it is very essential to eradicate the bat menace.

Generally, in a simple monument the entry of bats and birds is arrested by closing all the entry points with welded mesh, and naturally, the earlier thought was also the same. However, a cursory look at this monument of such magnitude is quite enough to know that it is not possible to provide welded mesh to all the openings, as there are open verandahs alround the enclosures with too many entrances, and even if it is porvided, it would be detrimental to the aesthetic beauty of the monument. Therefore, the idea of providing welded mesh to the openings was out of question. Instead, it was decided to provide welded mesh horizontally at a particular height in places where there is poossiblity of bats and birds making their nests. On experimental basis, first enclosure was taken up. Here, the welded mesh was fixed at a particular height where the wall and the spring-level of vaulted roof meet. Thus, the enclosure, towers, axial verandahs and garbhagrihas, covering an area of more than 500 sqm., have been provided with welded mesh. It is needless to say that this method has proved itself to be very successrful and is not in any way distracting the aesthetic value of the monument.

In this temple complex, situated in the tropical region, the cryogamous (micro-vegetation) growths such as moss, lichen and algae over the stone surface are not only covering the most beautiful carvings and presenting a monotonous appearance, but also damaging the surface by making microbes more either by eating away the cementing materials and thus disrupting the matrix of the stone. In addition, the hyphaes (micro-roots) of the same enter into the pores and secrete the organic acids which weaken the vital elements, particularly grits of the stone. The eradication of such growths, therefore, is very essential.

The method used in chemical cleaning and preserving is very simple. In the first instance, the surface

was moistened with water by spraying. Then, the area was cleaned with 1 to 2 percent solution of liquor ammonia, used only to neutralize acids secreted by the hyphae of the micro-vegetation, mixed with teepol, a non-ionic detergent, and by brushing gently with nylon brushes and tooth brushes and soft coir brushes, the surface was cleansed thoroughly with water. The area thus cleansed was treated with 2 percent solution of polycide, biocide and zinc silico fluoride separatrely. Ultimately, after complete drying of the area, it was preserved by applying a coat of 2 percent solution of polymethyl methacrylate in toluene.

It is heartening to know that the chemical treatment on the surface of the stones has not only exposed the original colour and texture of the monument, but also has brought back the expressious on the faces of the sculptures, which were not to be seen by any one to appreciate the supremacy of the Khmer sculptors over their proud art. The toraṇa (pediment) decorations of the second enclosure are the mute testimony for this good work (figs. XXV-XXVI).

The Archaeological Survey of India has not only conserved the magnificent temple complex, Angkor Vat, also has answered successfully the problems facing the monument. For this success, the credit should go to the cooperation extended by the Government of Cambodia, the local authorities in Siem Reap and above all to the intelligent work-force.*

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* Photograps are publishsed with the courtsey of the Director General, Archaeological Survey of India.

NOTES AND NEWS

The Harappan and Vedic Civilizations: An Analysis of Legacy

Since the last qurater of the 18th century, attention of scholars has been engaged on a critical assessment of some of the problems pertaining to the Aryans. Various views have been expressed concerning the original home of Vedic Aryans, their migrations, inter-relations with other races and the contribution made by the Aryans.

Several of the views about Aryans cannot be taken seriously at the present stage of the advanced knowledge. It is no longer held as tangible to believe that the Vedic Aryans destroyed the cities of Indus-valley civilization and that the Harappan culture was totally Aryan or that it essentially represented Dravidian Culture have also been set at rest.

Soon after the discovery of the Harappan culture in the Indus-valley, several scholars started laying stress on the conflict between the Indo-Aryans and the Harappans. Some of them went too far in arriving at the concllusion that the Vedic Aryans ruthlessly destroyed the alien Harappan Culture after defeating them. In support of their contention they referred to certain vedic passages. These scholars did not care to study the archaeological, linguistic and other evidences, while discussing the Aryan problem, and the proto-history of India and the contiguous regions.

The above and several other such hypotheses raised a lot of controversy during the 19th and the 20th centuries A.D. It is now almost unanimously held that the causes of the disintegration of the Indus-Valley Civilization lay in the tectonic changes, the earthquakes and the resultant floods in the rivers. It may be pointed out here that the decline of the Harappan urban civilization coincided with the downfall of several others, such as the Creto-Mycenean Civilization of Southern Europe.

The archaeological field work, conducted during the last seven decades in this conutry and outside, has furnished for study sumptuous source material bearing out the pre-Harappan and Harappan cultures. The evidence from West Asia, the Armenian Plateau and Central Asia is of considerable importance for the study of those cultures. The material obtained from Bahrein and other regions has clearly indicated that the Proto-historic Indians did not live in 'Splendid isolation' as was previously believed by several European scholars. The Bogazkuoi inscriptions, the Harappan seals from Bahrein and the evidence from the Zendavesta and Rigveda leave no doubt in regard to the cultural and commercial relations between India and several foreign lands (Mishra 1971). The Harappan seals and sealings furnish positive proof to the urban-oriented civilization with a strong commercial base.

The Harappan Civilization had attained a high standard of civic life, marked by a good grounding in the scientific and technological advancement. It had developed a strong administrative set-up, based on sound economy, a well-devised town-planning, accurate measurements of length, volume and time. The Harappans were familiar with a uniform script.

Efforts in the decipherment of the Harappan script have been continued since the time of its discovery. As regards individual scholars in the field, mention may be made of S.Langdon (Marshall 1931), P.Meriggi (1934), G.R. Hunter (1934), Pran Nath (1946), A.S. Ross (1953), Heras (1958), Sankarananda (1964), Mahadevan (1973-80), Fairservis (1977) and S.R. Rao (1973-81).

The Finnish, Soviet and Japanese scholars have recently taken up the task of making a structural analysis of the Harappan Script with computo's aid. The Finnish scholars (Parpola 1968-69) have mainly concentrated on the linguistic interpretantion, assuming that the language of the Harappan Culture was Dravidian or Proto-Dravidian. they have assingned a word-value to most of the signs, from which they have tried to derive syllabic values. the Soviet scholars (Knorozov 1972) assume that certain signs which are invariably terminals, served as inflexional suffixes.

According to them, the Indus language has sufixes only and it is Dravidian. Fairservis and Mahadevan have treated the Pseudo-pictures and also the simple linear signs as pictures. S.R. Rao has dismisseed the views of various scholars on the Harappan script (1981, 1985).

The endeavour of the Japanese scholars is reported to be more scientific and adequate, as they have embarked upon a comprehensive study of the script, taking help from all the relevant disciplines. It may take

sufficient time for them to arrive at a definite conclusion.

S.R. Rao has tried to arrive at the following main conclusion:

1. The Harappan Script forms an integral part of the civilization and should be relalted to the whole body of archaeological evidence.
2. The Harappan Script represents the mature Harappan period (2500 to 1900 B.C.). It is followed by the late Harapppan Phase (1900-1500 B.C.). The script of the late phase continued to be in use in the post-Harappan period in Gujarat and elsewhere almost upto 1000 B.C.
3. The survival of the Harappan script is suggested by the graffiti on Megalithic pottery of Deccan and South India.
4. The Harappan script is a mixed writing involving the use of pictures, pseudo-pictures and linear signs. The Late Harappan Script is a pure Linear Script.
5. This script cannot be called Pictographic or Ideographic. It is only phonetic or alphabetic.
6. The Harappan Script was written from right to left (This has been demonstrated by B.B. Lal in 1974).
7. The script is neither Sumerian nor Dravidian. It is Indo-Aryan. The Indo-Aryans or Proto-Aryans of the Indus-Valley moved into Balkh (Bactria) and South Russia on the one hand and the Ganga-Yamuna doab on the other during the late Harappan period.

The arguments put forth by Rao on the basis of the symbols and other relevant details seem to be fairly convincing. The view that the primary purpose of the seals was commercial also appears to be appropriate.

The question of authorship of the Harappan Script is involved with a number of points which may be considered here briefly:

The Harappan seals and sealings, although primarily secular in character, are not devoid of the religious significance. We may not agree with the view that any rigid cults had grown up during the Harappan period, as we find in the historical times. But the presence of certain human deities and symbolic figures on several sealings do indicate their religious import.

It is not plausible to assign the authorship of the Harappan Civilization particularly the mature one, to the Vedic Aryans, as has been suggested by some scholars. Several points of divergence in the life-pattern of the Vedic and non-Vedic people are distinct. The cremation of the dead in the Vedic system with the Agni-based ritualistic belief is in divergence with the burial system of the Harappan. Similaraly, the advanced art craft and an artistic script of the Harappans do not have for comparision any tangible and concrete forms in the known Vedic material culture of the early or later period. There are several other points for consideration.

All the same, the Harappan Civilization did possess the ritualistic element alongwith a high pattern of craftsamanship in a well-governed socio-economic set-up.

This ritualistic trend got a fillip at a later stage in the blending of the two civilizations, Non-Vedic and Vedic.

The available archeological evidence, when studied alongwith the Vedic literature, leaves no doubt in mind that the struggle for supremacy between the Vedic and Non-Vedic people eventually ended in the victory of Vedic Aryans. The socio-economic factors, particularly of the rural populace, were mainly responsible for the defeat of the Harappan non-Vedic people, whose inland endustry and outward trade had in course of time dwindled considerably. (Bajpai 1985: 21-26).

The battle of Ten Kings (*dāśarājña Yuddha*), referred to in the Rigveda, is a clear indication that the Vedic king Sudāsa became victorious over his adversaries, the leaders of the non-Vedic people. Refernce to the occupation of the town *Hariyūpiya* (indentifialble with Harappa) by the Aryan ruler Abhayavarti cayamāna, after defeating the Turvasas and the Vricivantas, is another important evidence of the Aryan victory over the Harappans.

From the Vedic texts and also the early *Purāṇas* and the *Mahābhārata*, we learn about the spread of Vedic Aryans towards the east and the south-west. The efflorescence of the Vedic culture in the Sarsvati Driśadvatī valleys and in the regions called Brahmarśideśa and *Brahmāvarta* coincided with the disintegration of the Harappan civilization. The Aryans found the region of Panjab and later of the Gangetic Valley congenial for the development of their culture. The Aryan culture gradually spread in the vast Vindhyan area.

It is illuminating to note that the vestiges of the Harappan Civilization took some roots alongwith the spread of the Vedic culture in the country. This is discernible both in the secular and religious spheres. The nature and impact of the Harappan symbology has not yet been adequately studied. Several symbols of deities, animals, birds, fish and other reptilges; the motifs of Sun, *svastika, nandipada,* boat and those of the three-pronged or five-pronged *śūlas* and other weapons are traceable in some of the archaic rock-paintings. Fire with thre flames represents the triple character of Vedic deity Agni. The geometrical patterns of different types of *vedis* and other Vedic ritualistic elements continued in Indian culture.

The Pancāla coins, apart from numerous historical seals and sealings, provide much useful data to indicate

the impact of Vedic culture during the successive periods. The figures of Surya, Agni and Indra as deities on the Panacāla coins and the symbols of *yajña-vedī* and of Rudra can be mentioned here. Their depiction is found on ringstones, seals, sealings and coins. The terracotta modelled figures of the Maurya period are strikingly akin to some of their Harappan and post-Harappan protoypes (Gupta 1980: 66-72, 99-115).

It is necessary to mention here that the linguistic evidence of the Vedic period has not yet been adequately studied for an appraisal of the Harappan language. Apart from the Vedic literature, works of Pāṇini, the *Nirukta*, the Mīmāṁsā sutras of Jaimini alongwith the *Śabarabhāṣya*, and other works on grammar can be utilized in the order to understand in proper perspective the heritage enshrined in the Harappan and Vedic Civilizations. The culmination of these two great civilizations resulted in and integrated way of life and thought, known as Indian culture. But it has to admitted that in this culture the more predominant and continued role has been that of the Vedic and not of Harappan civilization.

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Kamauli Copper Plate Inscription of Govindachandra (Vikrama Year 1197)

The inscription on single Copper-plate was engraved on one side only measuring 41.2 cm. in length and 31.7 cm in height. There is a circular hole (about 3 cm. in diametre) about the centreof the top part. It was discovered in October 1892 in the village of Kamauli, Varanasi District, Uttar Pradesh. The plate is now deposited in the state Provinicial Museum at Lucknow. The inscription was noticed by F. Kielhorn (1897: 114) who ignored the text. The inscription is being edited herewith from the original and an excellent photo supplied by S.D.Trivedi, Director, State Provincial Museum, Lucknow to T.P. Verma.

The plate contains 27 lines of well preserved writing. The language of the inscription is Sanskrit, Written in Nāgarī characters. The grant is partly in verse and partly in prose. There are in all 21 verses.

The date of the grant is quoted in line 15 as saṁvat 1197, Phālguna-vadi 1, Sunday. The year Vikrama-saṁvant 1197 expired, corresponds to the 23rd February, A.D. 1141.

The record begins with the well-known *siddham* symbol followed by the words *Oṁ siddhiḥ*. After the invocatory verse in prasise of the goddess Lakshmī (verse 1) the inscription gives the usual genealogy of the Gāhaḍavāla family commencing with Yaśovigraha, recounting (lines 2-11) the eulogy of the successive kings Mahīchandra, Chandradeva and Madanapāla, the reocrd proceeds to mention Govindachandra. The royal order is addressed (lines 11-13) to the inhabitants of Ḍāmala village situated in Kharahashepaśeha pattalā (district) as well as the people of the coutryside and dignitaries beginning with rājas, rājṇīs yuvarājas, mantrīs, purohitas senāpatis, pratihāras, etc. The details of the grant are given in lines 13-19. After having taken a bath in the waters of the Ganga at the ghaṭṭa of the holy god Vedeśvara, at the Avimukta kshetra of Varanasi and performing other ceremonies Govinda-chandra is s tated to have granted, on the date indicated above, the village called Ḍāmala with its pāṭaka situated in the pattalā of Kharahashepaśeha. The donee was the Dīkshita śrī-Jāguśarman who belonged to the Baṁdhula gotra and the Baṁdhula, Aghamarshaṇa and Viśvāmitra pravaras. He was the son of the Dīkshita-śrī-Purushottama. The grant was of a permanent nature. The land was granted together with its water and dry land, mines of iron and salt and with its groves of madhūka and mango trees, enclosed gardens, bushes,grass and pasture land. The donee was entitled to enjoy all taxes including *bhāga* (share of crops), bhoga (Periodical offerings), kara (taxes in general) and the special taxes known as *pravaṇikara*, *turushkadaṁḍa* and *Kumāragadiāṇaka*, which have been variously explained. Of these three levies, *pravaṇikara* was probably a tax on foreign merchants and *turushkadaṁḍa*

either a tax to meet the expenses of defence against the Turkish Musalmans or a levy from Musalman subjects or traders. As for kumāragādiaṇa, it was probably a tax of one gaddyāṇa (i.e. the coin of that name) payable on the occasion of a prince's birth (Sircar 1966:166). Then follow twelve usual imprecatory and benedictory verses asking people not to tamper in any way with the grant. The coper-plate inscription was written by Thakkura śrī-Dhādhūka.

Of the geographical names figuring in this inscription Kāśī, Kuśika, Uttra Kosala Indrasthāna, Kānyakubja, Vārāṇasī, Avimukta-kshētra, Vedeśvara-ghaṭṭa and river Gaṅgā are too well known to need any identification. However, the gifted village Ḍāmala and the pattalā Kharahaśhepaseha are yet to be identified.

Text

(Metres: Verses 1,3,10-18, Anushṭubh, verses 5-6,8,21, Vasantatilakā; verses 2,19, Indravajrā; verses 4,7, Śārdūlavikrīḍita; verse 9, Drutavilambita; verse 20, Śālinī)

1. Siddham[1] Oṁ siddhiḥ // Akuṁṭh-otkaṁṭha-vai kuṁṭha-kaṁtha-pīṭha-luṭhat-karaḥ / saṁrambhaḥ surat-āraṁbhe sa śrīya (ḥ*) śreyase-stu vaḥ // (1*) Āsīd=Asī (sī) tadyuti-vaṁsa (śa)-jāta-kshmāpāla-mālāsu divaṁ-

2. -gatāsu / sākshsād = vivasvān = iva[2] bhūri-dhāmmnā nāmnā Yaśovigraha ity = udāraḥ // (2*) Ta (t) - suto = bhūn = Mahīchaṁdraḥ (ś) = chaṁdra-dhāmaa-ti (ni) bhaṁ (ni) jam / yen = āpāram = aku (kū) pāra-pāre vyāpāri-

3. taṁ yaśaḥ // (3*) Tabhy (sy) = ābhūt = tanayo nay-aika-rasikaḥ krāṁta-dvishan-maṁḍalo dhiddhabht[3] - oddhata-vīra-yodha-timira (ḥ) śrī-Chaṁdradevvo nṛpaḥ / yen-odārtara - pratāpa-sa (śa) mit-āśeshaprav (j)-opadravaṁ śrīma /-[4]

4. d-Gādhe (dhi) pur-ādhirājyas (m) = asamaṁ=dor-vi-kramen = ārjitaṁ / (4). Tīrthāni Ka (Kā) si (śi)-Kusi (śi) k-Ottarakośa(sa)l /-(e) ndraḥ (ndra)-sthā-nīyakāni paripālayatā = bhigamyaḥ (mya) / ehes (m) = ātm-tulyam=anisaṁ (śaṁ) dadatā dvije-

5. bhyo yen=aṁkitā vasumatī sa (śa) taśas=tulābhiḥ // (5) Tabhy (sy)=ātmajo Madanapāla iti kshitā-(tiṁ) draś=chūḍāmaṇir-vijayate nija-gotra-chaṁdraḥ / yasy=ābhisheka-kalas (ś)-ollasitaiḥ payobhiḥ.

6. prakshālitaṁ kali-rajaḥ paṭalaṁdharitryāḥ / (6). Yasy=āsīd = vija (ya*)-prayāṇa samaye tuṁg-āchalochchaiś=va (cha) lan=mādyat-kuṁbhi-pada-kram-āsamabhara-bhrasya (śya) n-mahī-maḍale (1*) chūḍā-ratna-vibhinna-tālu-

7. galita-stya (styā)t(n)-āsṛg-udbhhāsa (Si) taḥ śesha-(ḥ) ppe (pe) sha-vasā (śā) d=iva kshaṇam=abhau (sau) kroḍe nilīn-ānanaḥ // (7*) Tasmād=ajāyata nij-āyata vā-(Bā) dga (hu)-valli-vaṁ-(baṁ) cḥv (dh)-āvaruddha-nava-rājya-gajā (jo) nare (reṁ) draḥ (1*) sāṁja (dr-ā) /-

8. ma(mṛ)ta-drava-muchāṁ pracha(bha)vō gavāṁ yō Gōviṁdachaṁja(dra) iti chaṁdra iv=āṁvu-(bu)rāśēḥ / (8*) Na katham=apy=alabhaṁta raṇa-kshamāṁs=tisṛshu dikshu ma(ga)jān=atha cha(va)jriṇaḥ / kakubhi va (ba) bhramur=abhramuvallabha-pra/-

9. tibhaṭāiva yasva (sya) gajā-ghaṭāḥ // (9*) So = yaṁ samasta-rāja-chakra-sa (saṁ) sevita-charaṇaḥ / sa cha para-mabhaṭṭāraka-mahārājādhirāja-parashe (me) scha (śva) ra-paramamāheśvara-nija-bhuj-opārjjita-Kanyaku-

10. vj (bj)-ādhipatya-śrīmach[5] - Chaṁdradeva-pādānudhyāta-[6] / paramabhaṭṭāraka-mahārājādhirāja-paramesva (śva) ra-paramamāhesva (śva) ra-śrīman-Madanapāladēva - pād - ānudyā - (dhyā)t- / paramabhaṭṭāraka-mahā/-

11. rājādhirāja-paramēsva (śva) ra-parata(ma)-māhe(śva) r-āśvapati-gajapati-narapati-rājatra-y-ādhipati vividha-vidyā-vichāra-Vāchaspati[7] śrīmad-Gōviṁdachaṁdraṭē (de) chō (vō) vijayī // Kharaha

12. shēpaśeha-pattalāyaṁ (yāṁ)[8] sapāṭaka Ḍāmala - grāmyā--nivāsitō (nō) ti (ni) khila-jama (na)-padān=Upagatān=api (cha*) rāja-rājñī-yuva-rāja-maṁtri-purohita-senāpati-pratīhāra-bhāṁḍārā(gā)rik-ākshapa /

13. ṭalika-bhiḥ (bhi)shag-ne(nai)mittik-āṁtaḥpurika-dūta-kari-turaga-pattan-āma (ka) rasthāna-gokul-ādhikāri--purushāt (n)-ājñāyaty-ādiśati[9] cha / Yathā viditam=astu bhavatāṁ yath=opari-lishi (khi)-

14. ta-grāma (ḥ*) sa-jala-sthala (ḥ*) sa-loha-lavaṇ-ākara (ḥ*) saparṇṇamaśyākara[10] sa-gartt-oshara (ḥ*) s-ā (mra)-madhūka-vana-viṭapa-vāṭi-kā-tṛiṇa-yūti-gochara-parpa (rya) ntaḥ / s-ordhā (rdhv-ā) dhaś=chatur-āghāṭā (ṭa)- visu(śu)ddhaḥ sva-sī

15. mā-paryantaḥ / saṁvat 1197 Phālhu (lgu) navadi 1 Ravau // Vṛihad-rājñi divase ady=eha śrīmad-Vārāṇasyāṁ Avimukta-kshetre deva-śrī-Vedeśvara-ghadde (ṭṭe) Gaṁgāyāṁ snātvā vidhivata-pitṛ-

16. muni-manuja-bhūta-gaṇāṁs=tarppayitvā timira-paṭala-pāṭana-paḍu (ṭu)-mahasam=Ushṇa-rovi(chi)sham=upasthāy-Ai (Au) (sha) dhipati-sa-(śa) kala-śekharaṁ sasa(ma) bhyarchya tribhuvana-trātur = Vvāsudevabhya (sya) pūjāṁ vi-

17. dhāpa (Ya) prachura-pāyasena havishā havi-bhbhu(rbhu)-ja (jaṁ) (hu)tvā mātāpitrōr=ātma-na(ś-cha) puṇa(ṇya)-yaśō-chi(bhi) (vṛi) ddhape-(ye) / Vaṁ(Baṁ) dhula-gōtrāya Vaṁ(Baṁ)dhu-la-Aghamarshaṇa[11] Viśvāmitra triḥ(tri) prava-rāya / Dīkshita-

18. śrī-Puchu (ru) po (sho)ttama-pautrāya / (Dī)-kshita-śrī-Vilhā-putrāya / Dīkshita-śrī-Jāgūsa (śa) rmmaṇe Vrā (Brā) hmaṇāya gokarrṇṇa-kusa (śa)-latā pūta-karatal-odakena-asmābhiḥ āchaṁdr-ārkka (ṁ*) Yāvach-chhā(śā) sanī-

19. kṛitvā pradattaḥ / matvā yavā(thā)-dīpa (ya)-māna-bhāga-bhoga-kara-pravaṇikara-turupka(shka) daṁḍa-kumaragdiśvā(yā)ṇaka-prasri (bhṛi) ti-samastā-nniyatā-s..yatā-dāyān-ājñāvidheyībhūya dāsya-

20. th=eti / Bhavaṁti ch=ātra paurāṇikā śno-(ślo)kāḥ //[12] // Bhumi (ṁ*) paḥ (yaḥ) pratigṛjrā. (hṇā) ti yaś=cha bhūmiṁ prayachcchhati / ubhau tau puṇya-karmmāṇau niyanaṁ (taṁ) svargga-gāmino (nau) // (10) Saṁ (Śaṁ)-khaṁ na (bha)dr-āsanaṁ chchha (chha) traṁ va-

21. rāsvā (śvā) vara-chā(vā) raṇaḥ (ṇāḥ) // (1) bhūmi-dānasva (sya) chihnāni phalam=etat = Puraṁdara // (11*) Shavvi (shṭiṁ) varsha- sahasrāṇi svargg (e*) -vasati bhūmidaḥ / (ā) chchhetvā (ttā) ch=ānumaṁtā va (cha) tāny= eva[13] narakaṁ (ke) vrajeta[14] // (12*) Svadatvām (ttāṁ) para-

22. datvāṁ (ttāṁ) vā po(yo) hared (ta)-vasuṁdharāṁ / sa vishṭhāṁ(yāṁ) kṛimir= bhūtvā pitṛibhiḥ saha majjati // (13*) Vāri-hīneshv= araṇyeshu śushhchha (shka)-koṭara-vāsinaḥ / kṛishṇa-sarppāś=cha jāyante deva-vra (bra)-hmasva-hāriṇaḥ // (14*)

23. Na vishaṁ visham=ity=āhur=vvra (bra)hma-svaṁ visham=uchyatē / vidya(sha)m=ekākitaṁ (naṁ) hari(nti) vra(bra)ya(hma)-(svaṁ) putra-pautrakaṁ // (15*) Gām=ekaṁ svarṇṇam=ekaṁ (cha*) bhūmer=app(py)=ekam=aṁgulaṁ. / haran=narakam=āpnoti yāvad-ādra (hū) tasaṁ-

24. plavam // (16*) Taḍāgānā (ṁ) sahsreṇa a (śva)-medha-sa(śa) tena cha / gavāṁ kōṭi-pradānena bhumi-harttā na su(śu) dhyati // (17*) Va (Ba) hubhịr=vasudhā bhuktā rājabhiḥ Sagar-ādibhiḥ / yasya yabhya-(sya) yadā bhū-

25. mis=tasya tasya tadā pa(pha) laṁ // (18*) Yāt (n)= ī(ha) dattāni purā narēṁdrai (r*)= dvā (ddā)nāni dharmm= āṇi(rtha) yasa (śa)- skarāṇi /nirmmālya-vāṁta-pratimāni tāni ko nāma[15] sādhuḥ punar=ādadīta / / (19*) Sarvvān = etā-

26. nbhāvinaḥ pārthiv=eṁdrān bhūyo ja(bhū)yo yāchate Rāmabhadraḥ / sāmānyo= yaṁ dharmma-senu (tu)r=nṛipāṇāṁ kāle kāle pālanīyo bhavadbhiḥ // (20*) Vāt-ābhra-vi-bhramam=idaṁ vasudh-ādhipatyam= ā-

27. pātanā (mā) tra-madhurā vishay-opabhogāḥ / prāṇās= tra (tṛ) ṇāya (gra)-jalavi (ṁ*) ḍu(du)samā narāṇāṁ dharamma (ḥ*) sakhā param=aho paraloka-yāne // (21*)[16] // Likhitaṁ ch=edaṁ vā(tā)mra-padda (ṭṭa) kaṁ ṭhakkura-śrī-Dhādhūkena //

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NOTES

1. Expressed by a symbol.
2. Original bears *sākshādvivamvāticha.*
3. Read *vidhvast.*
4. This and other strokes at the end of succeeding lines are intended to mark the continuous word.
5. read *śrīman.*
6. This sign of punctuation and others in lines 10-19 are superfluous.
7. Original bears *Vāshaśpati.*
8. Kielhorn suggested the name of the village as Samala while ignored the name of the *pattalā.*

9. Read *payati bodhayātyādiśti.*
10. Read *samatsyākaraḥ.*
11. There are *vaṁdhulavashamarshaya* in the original.
12. A sign looks like letter *chchha* is engraved between the punctuation marks.
13. Original bears *dvāveva.*
14. Read *vaseta.*
15. Original bears *nāsa.*
16. A sign looks like letter *chha* is engraved between the punctuation marks.

Excavations at Imlidih Khurd

The mound of Imlidih Khurd (Lat. 26° 30' 30" North, Long. 83° 12' 5" East) is located on the left bank of the Kuwana (Kuwano) river, a tributary of the Ghaghra in the south-western part of Gorakhpur destrict. The survey of this region fell to us in 1990-91 (Singh *et al.* 1990-91:49-62). This settlement is located about half a kilometre north-west of the small town of Sikriganj on the Gorakhpur - Gola road, about 40 kms. to the south of the district headquarters. The ancient settlement spread over an area of 15-20 acres has been partly occupied by the present-day Imlidih village (Fig.1).

Our earlier investigations conducted at Narhan, located about 30 kms. east of Imlidih during 1983-88 brought to light the existence of an independent culture, termed as NARHAN CULTURE. It is characterised by the white Painted black - and - red ware as the principal ceramic industry datable between 1300-900 B.C. In order to see the extension of Narhan culture on the tributaries of the Ghaghra, intensive surface explorations were carried out on both banks of the Kuwana in Gorakhpur and Basti districts (Singh *et al.* 1990-91: 69-82; 1991-92 33-34 and as many as seventeen sites of Narhan culture were located. Of these, Imlidih was subjected to archaeological excavations during February-May 1992 and as will be seen below, these investigations were rewarding in more than one way.

Period I (Pre Narhan Culture: Suggested date Pre 1300 B.C.)

The major achievement of the Imlidih excavation is the discovery of an antecedent phase of culture having a deposit of 50-60 cms. stratigraphically occuring below the Narhan culture and hence termed as "Pre-Narhan" for the time being. The diagnostic trait of this culture is its characteristic pottery hitherto unrecorded from Narhan, Khairadih, Manjhi etc. but supposedly present at Sohgaura in the limited dig of 1963.

The pottery of Pre-Narhan Culture is essentially a crude red ware, some of it bearing cord-impression on the exterior of the pots and hence termed "Corded Ware", the others beings vessels of plain red ware. In both cases the clay contains good amount of degraissant which got burnt during firing and it resulted into a porus surface. Most Vessels, Particularly the Globular Vases, have thin, sandy, friable core; some of them having mica pieces. The vessels are generally ill-fired leaving a black, gritty core.

The main types in the cord-impressed ware comprise pedestallled bowl with incurved rim and cord-impressed patterns on the exterior (Fig.2 No.3) and a slipped and heavily burnished interior. The Height of a Complete bowl is 7 cms. and the diameter of the rim is 16 cms. A close examination revealed that the pedestal of such bowl was made separately, presumably on wheel, and it was affixed to the body of the vessel. Similarly, the rim was made separately and attached to the body of the vessel. The second type of vessel is the vase with a flaring rim, constricted neck and expanding sides, making a globular pear-shaped body. This vessel bears cord-impressed designs just below the neck and all over the exterior (Fig. 2, Nos.6.8). The third type of vessel is *handi*-like vase with out-turned or flaring rim, and expanding body just below the neck and sharp carination at the waist which has been occasionally decorated with applique strip of clay bearing rope pattern, finger-nail pattern and chain pattern (Plate XXVI). This type of vessel bears cord-impressed patterns below the carinated waist on the exterior which has a sagger base. This vessel has a small spout luted at the shoulder. Some of the vessels of this period are painted with dots and dashes in creamish red colour over a red surface (Plate XXVII) and by post-firing incised geometrical patterns. (Plate XXVIII).

The inhabitants of Period I lived in wattle-and-daub huts represented by reed marks in large numbers (Plate XXIX). Several floors made of mud, oven and furnace marked the other structural activities. The small finds comprise several micro beads of steatite, other beads of terracotta, agate and faience, bone points and pottery discs.

A tentative taxonomic classificationn of faunal remains done by Umesh Chandra Chattopadhyaya of the University of Allahabad shows that cattle, sheep/goat and presumably pig had been domesticated. Among these, cattle remains predominate and often bear characteristic butcher's

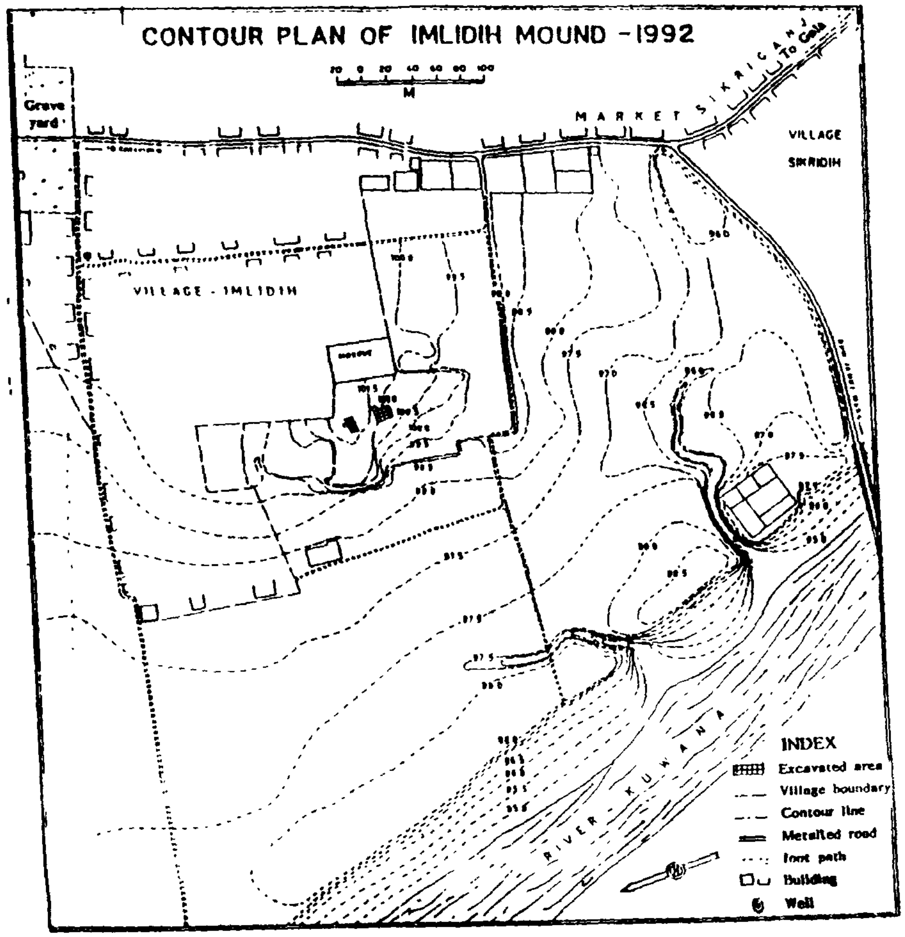

CONTOUR PLAN OF IMLIDIH MOUND - 1992
M
Grave yard
MARKET SIKRIGANJ
To Gola
VILLAGE SIKRIDIH
VILLAGE - IMLIDIH
RIVER KUWANA
INDEX
Excavated area
Village boundary
Contour line
Metalled road
Foot path
Building
Well

Fig. 1

marks, the wild ungulates comprise hog deer and possibly wolf. The aquatic resources comprise two species of fresh water turtle, fish of small and medium size and fresh water mollusca. The archaeological remains are also under study by K.S. Saraswat of Birbal Sahni Institute of Palaeobotany, Lucknow.

Period II (Narhan Culture C.1300 B.C.-800 B.C.)

We were struck by intense structural activity comprising at least two successive mud floors having several post-holes, furnaces and ovens. The characteristic pottery of this period consists of the white -painted black-and-red ware with such shapes as various types of bowls, dishes-on-stand and lipped basins. This ware is well-documented at the type-site, located about 30 kms.east south-east of the present site and it is the principal ceramic industry of this period. However, only coarse and medium fabrics of this ware are present and vessels of fine fabric are generally absent. Sherds of burnished black-and red ware, comparatively rare at Narhan, are prolific at Imlidih. In the black slipped ware of this period and important typological addition is the *lota*, of which serveral specimens have been recorded. Some of these bear painting on the exterior with vertical lines drawn from the rim down to the neck. The Red slipped ware recorded earlier from Narhan in limited quantity is totally absent at Imlidih.

The small finds from Period II comprise bone points, pottery discs, terracotta beads, a copper arrowhead and two copper beads. An important addition in the artistic repertoire is the small beads of steatite, some of them exhibiting fine workmanship.

The faunal remains of Period II comprise domesticated cattle, goat, sheep, horse and dog. The wild fauna comprises boar, dog, deer, chital or spotted deer and barasingha or swamp deer. As in Period I, the assemblage here is dominated by the cattle remains. The horse remains comprise a mandible with first and second premolars and an isolated molar/premolar.
This animal, medium to large in size, is of domestic type and similar to those represented from Narhan culture and the chalcolithic levels of Koldihwa. The aquatic resources of Period I except mollusca, reoccur in this level though in smaller concentration. Chicken seems to have contributed to the human diet.

Period III

Badly distrubed by present-day agricultural activities in this part of the mound, Period III is marked by the absence of black-and red ware and a dominace of red ware. The frequency of black-slipped ware increased in this period. The other wares comprise a few sherds of grey ware. Besides, a solitary sherd of NBP ware was picked up from the surface. The cultural assemblage of this period is comparable to that of Period II of Narhan.

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Excavations at Kotra 1988-89

Kotra is located about 40 km. from district headquarters of Dewas towards south-west of Sonkachha on the western bank of the river Kalisindha, a tributary of the Chambal. The ancient mound oriented north-south cloven by a rain gulley measures 250 m x 30 m x 11 m and 150 m x 5m respectively and is perched on a 10 m high basalt ridge. The northern half of the mound is occupied by the village habitation whereas on its southeastern portion exists a garhi. With a view to ascertaining the chronology the site was taken up for excavations in the direction of autor on behalf of Prachya Niketan, Centre of Advanced Studies in Indology and Museology, Bhopal.

Two trenches viz. KTR-1 measuring 19 m x 5 m east-west across the mud wall and KTR-2 measuring 6 m x 8 m north-south were taken up about 7 m away from the northern fringe of mud fortification wall in a cultivated field

Period IA (c. 1800-1700 B.C.)

Ceramics of this phase are hand-made, turned on slow-wheel are coarse to medium fabric, some treated with thick chocolate slip, plum-red-slip, lustrous red ware, black-and red ware painted with white paintings of Ahar fabric to include drab and rusticated ware. Besides, simple red ware with ochre wash, decorated ware with incised designs consisting of row of diamonds, zig-zags, herring bone, honey-comb, wavy lines and trellis pattern. Types include storage jars, *handis*, deep-bowls of black-and-red ware, bowls of cream-slipped ware and large basins. Other finds include parallel-sided blades, lunates made of silceous material, sling balls, pestles and banding balls, made of basalt.

Architectural activities were limited to mud floors, remains of mud-wall measuring 6.5 m long and 38 cm. wide alongwith a thickness 6 cm. post-holes and remains of burnt-clay lumps with impressions of wooden and reed posts. The floor laid on the natural soil was made of mud, kankar and rammed burnt earth.

A similar floor approximately 7 to 10 cm thick made of rammed earth with remains of mud wall with impressions of reeds and bamboo post-holes and two pestles were found in KTR-2. Because of limited diggings full house-plans and other architectural features including household material could not be ascertained.

Period IB (C. 1700-1500 B.C.)

This phase is marked by overlap of Ahar and Chalcolithic Malwa black-on-red ware, white painted black-and-red ware of Ahar type and Malwa fabrics, both found in equal ratio although drab red pottery, incised pottery of preceeding period continues.

Decorative designs include vertical wavy horizontal bands, oblique strokes, geometrical and chequered designs, loops, diamonds in rows, stylised animals, snakes, deers, centipedes, date-trees, etc. The paintings are executed in black or brown colours restricted mainly on the upper part of vessels.

Pottery types encountered are flaring rimmed and corrugated *handi*, *lota*, deep bowls both carinated and uncarinated, basins and a solid stem of dish-on-stand.

The antiquities recovered included terracotta toys, wheels, discs, hop-scotches, terracotta bulls, blades, lunates, fluted cores, sling-balls, pestles, mullars of trap, stealite flat-based, terracotta, copper and stone beads and terracotta cakes.

This is comparable with early phase of Navdatoli.

Period II (C.1500-1200 B.C.) Malwa Culture

It Coincides with layers 4 and 5 of KTR-1 and layers 1 and 2 of KTR-2. This period is marked by disappearance of ceramics of Ahar type while the Black-on-red ware of Malwa fabric with repertoire of various designs are in prolific. The paintings of the preceending period continue and the new designs including stylised animals, snakes, stylised deer, sun-symbols, trident, various geometrical and chequered patterns make their way.

The pottery types of preceding period continues but during this phase *lota* becomes prominent. Mention may be made of a painted stem of dish-on stand (pl. XXX).

Among the antiquities hop-scotches, miniature stone balls, terracotta beads, blades, lunates, stone pestles, hammer stones, mullers, fabricators and a piece of copper have been discovered.

Architectural activities were evident from the floor made of rammed-bricks, and concrete-blocks brought from the river. Burnt lumps of wood and impressions of wattle and daub, post-holes suggest the houses of perishable material

Period III (C.750-300 B.C.)

This period restricted only in KTR-1 is marked by disappearance of pottery of preceding period and emergence of black-slipped, black-and-red, NBP ware and a solitary punch-marked coin. It appears that after abandoning the site this portion was occupied by new settlers.

Main types are *handis*, bowls with featureless rim, lids with circular knob, shallow lids etc.

Antiquities are bone stylus, black-and-red discs, human figurines made on potsherds, discs, gamesman, wheels, bangles of shell, glass, iron-nails, arrow-head, spear-head and a copper ring.

Structural remains, as already referred above consist of a massive mud-wall measuring2.39 m. wide extant height of 49 cm. and 23 m in northern and southern sections respectively. The structure was constructed with mud and the debris of previous period.

Remains of burnt, lumps of clay, with reed and bamboo, absence of bricks and presence of roof tiles show that the houses were constructed of perishable mateial with roof-covered by roof-tiles.

A deposit of kankar gravels on the section looking north and the marks of conflagration and presence of pits show a considerable gap which needs to be probed by further excavavtions.

The place might have served as an out-post or ferry point, commanding strategic position, during the great

kingdom of Avanti when Pradyota a contemporary of the Buddha (c.563-487) and his successors were rulers. It is from here the travellers crossed the river Kalisindha, on way to Ujjaini and vice-versa.*

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Sulabhdihi: A Neolithic Celt Manufacturing Centre in Orissa

In recent years there has been a growing emphasis on the systematic study of lithic production workshops for reconstructing economies of the prehistoric communities (Ericson and Purdy 1984). Numerous studies of such sites in many parts of the world have shown that not only they provide very importnat data relevanat to the problem of interpreting lithic production systems of the prehistoric cultures, but they also offer tremendous potential for testing hypotheses with regard to past regional or inter-regional exchange systems (Wright 1970, Bucy 1974, Earle and Ericson 1977, Hughes 1977, Ammerman 1979, Bosch 1979, Ericson and Earle 1982, Refrew and Shennan 1982. Torrence 1986. etc.). The potentialiy of this class of archaeological evidence has not yet been fully appreciated in the Indian subcontinent and sites of this category remain mostly neglected. In this connection, it may be recalled that Bruce Foote (1986) reported a few stone axe factory sites in the Bellary district of Karnataka and in the Shevroy hill ranges of Tamilnadu. It is surprising that the sites remain still uninvestigated in spite of the fact that they still remain one of the rare sites of this kind in the sub-continent. In view of this, the recent discovery of a neolithic celt manufacturing site in the Bonaigarh subdivision of the Sundargarh district of Orissa becomes significant.

Recently, while investigating the Brahmani valley in the Bonaigarh subdivision I had come across a mass production centre for semi-finished celts near the village Sulabhdihi. Considering the huge accumulation of artefact debris at this site, it is only reasonable to presume that it must have served as a very large neolithic celt production centre for quite a long time span in this part of the 'Central Eastern Neolithic Zone'.

The circumstantial evidence also suggests that while most of the semi-finished celts from this site were supplied to the foothills and river bank areas of Bonaigarh where they were given final shape at or near the site of consumption or use, production of specific celt-type, *viz.* the bar-chisels with triangular medial cross-section and bevelled working end were probably intended for long distant trade. However, in view of the initial stage of our study we are hardly in a position to furnish conclusive data in support of the above assumption. Hence a preliminary account of the archaeological evidence examined pertaining to the celt production at the Sulabhdihi site forms the subject matter of this paper.

The Area and The Site

The village Sulabhdihi is situated in the southern region of the Bonaigarh subdivision, which forms a part of the southern extension of the vast expanse of the Chota Nagpur plateau (Singh 1971). With the exception of the narrow oblong tract of alluvial plains along the river Brahmani, the whole of the subdivision is extremely mountainous (Fig. 1) with dense forest cover. The general topography of the area is characterised by the frequent occurrence of residual outcrops of rock masses, rough badlands and erosional surfaces.

The celt manufacturing site in the form of four large debris mounds is located in the vicinity of the village Sulabhdihi (Fig.1). These mounds have been entirely made of artefact debris accumulated during the process of manufacturing celts. the approximate diameter and height of the four mounds above the surrounding plains measure 3 x 160 m (Mound-I), 1 x 90 m (Mound - II), 2.5 x 140 m (Mound - III) and 3 x 95 m (Mound - IV), respectively. Unfortunately, the debris deposit of the Mound - I has been exploited by the local contractors for constructing a metalled road, as a result of whic a sizeable portion of the mound has been laid bare. However, the other three mounds are well preserved and intact.

The exposed section of the Mound - I revealed a deposit of artefact debris mixed with reddish sandy-silt of about two metres in the middle (Plate XXXI), directly resting on a layer composed of yellowish-brown compact

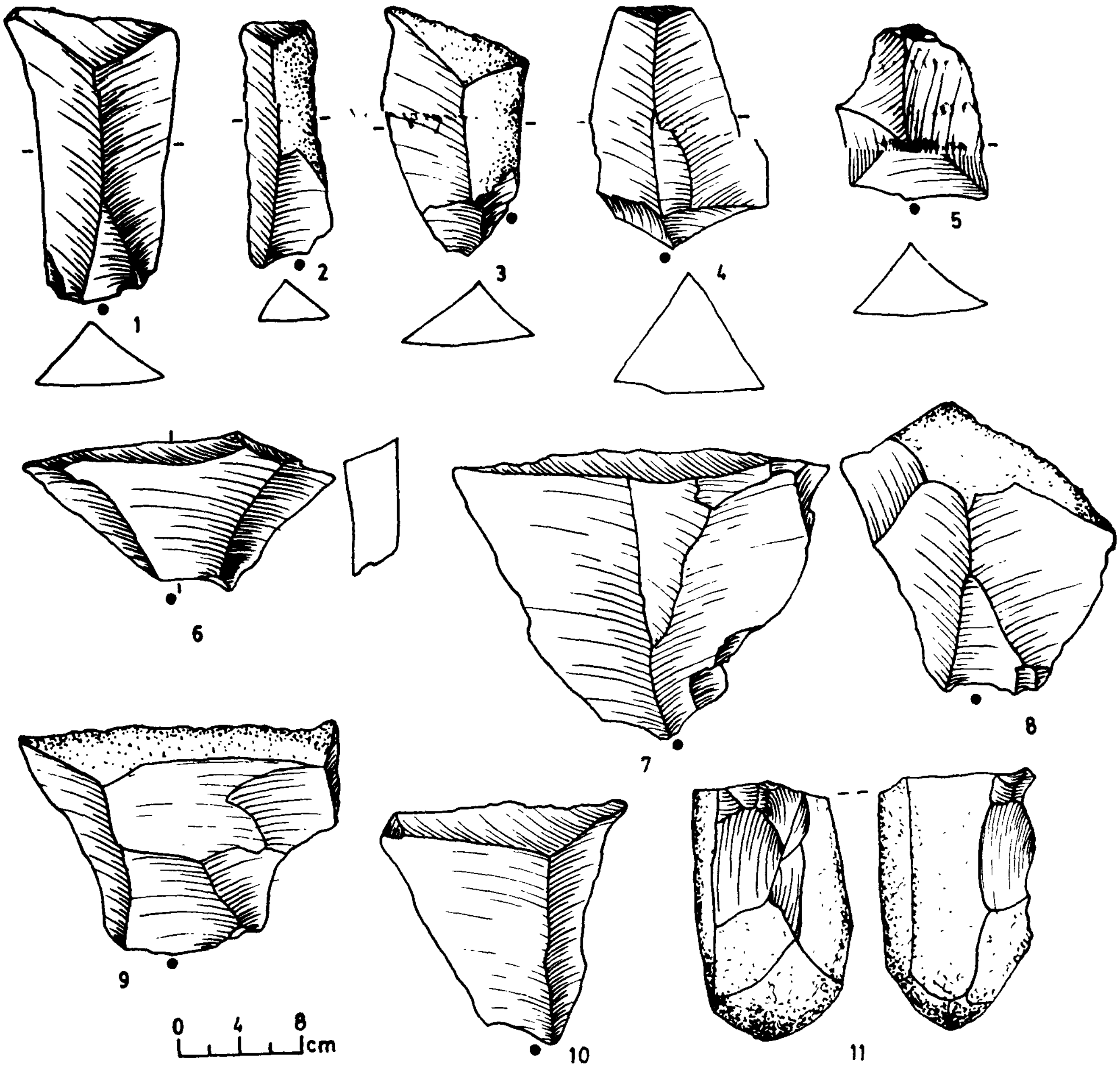


Fig. 1

Fig. 3

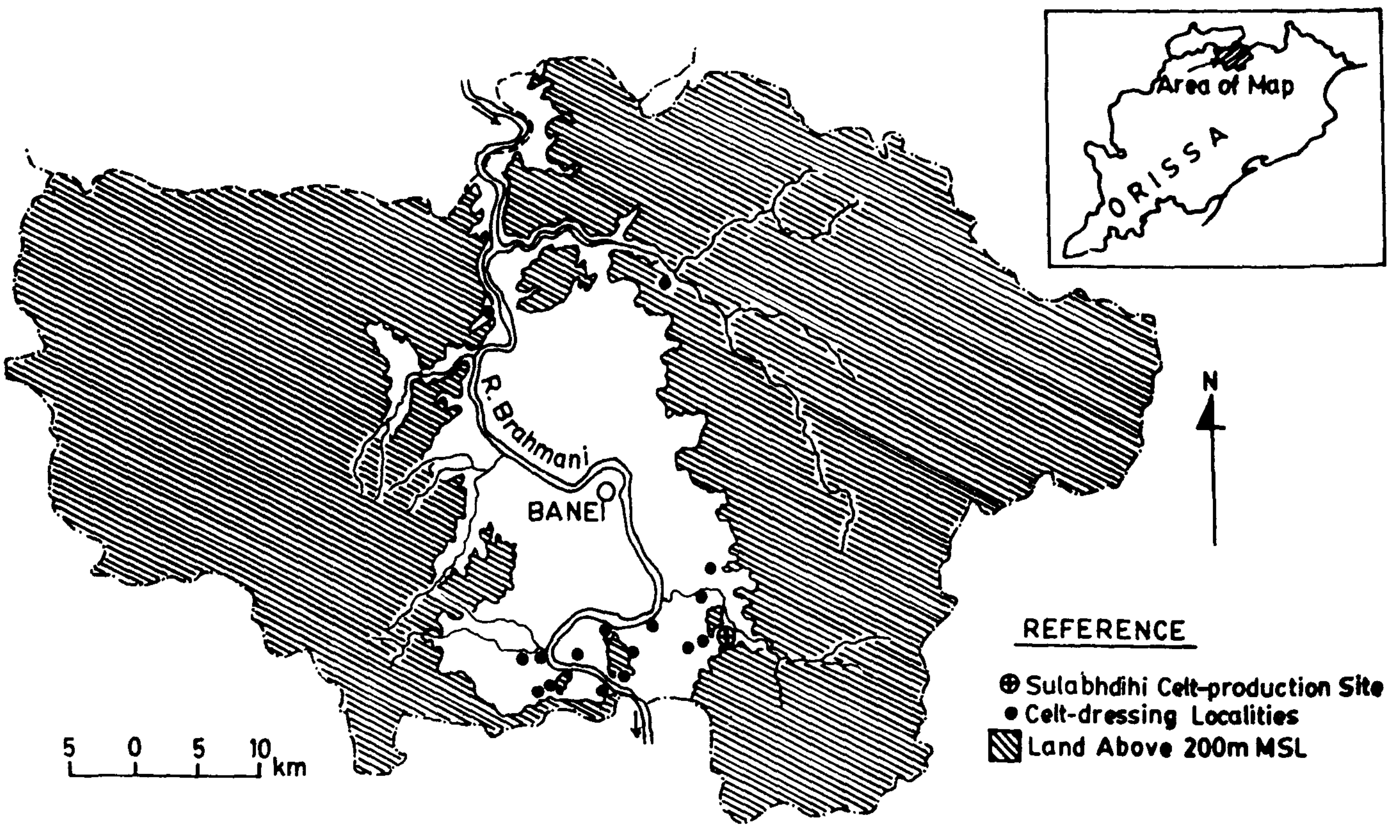

Area of Map
ORISSA
N
R. Brahmani
BANEI
REFERENCE
⊕ Sulabhdihi Celt-production Site
• Celt-dressing Localities
Land Above 200m MSL
5 0 5 10 km

Fig. 2

silty-clay soil mixed with weathered dolerite cobbles. Since detailed examination through excavations of the debris deposit of the other three well-preseved mounds could not be undertaken because of constraints of time and resources, the already exposed Mound - I has been thoroughly investigated. A brief account of the artefactual composition of Mound-I as well as the evidence for celt manufacturing process at this site is given below.

Raw Material

The exploitation of raw material is indicated by the occurrence of numerous rectangular shaped dolerite boulders. Almost all the artefacts of this manufacturing site are made of this raw material which occurs *in situ* in parts of Bonaigarh. These boulders were brought to the site probably from the nearby foot hill slopes. Their length, width and thickness fall between 71 and 12 cm, 51 and 8 cm, and 36 and 7 cm, respectively.

Boulder Cores

Since almost all the celts of this site are made of flakes and blades, careful preparation of cores out of dolerite boulders was obviously the basis of the entire celt-making process. The cores are generally massive in size and their length, width and thickness vary from 69 to 18 cm, 51 to 10 cm 39 to 10 cm, respectively. The platforms are generally prepared unfaceted and broad with angle variation from 65° to 85°. The blank removal surface of these cores in majority of the cases, shows bidirectional negative scar patterns. Some of these also exhibit marks of ridge preparaqtion for the removal of thick blade blanks (Fig.2.11). However, natural ridges of the dolerite boulders have also been extensively utilized for the removal of thick flakes and blades.

Flake-Blade Blanks

The second category of artefacts constitutes thousands of specially struck thick flakes and blades. A study of these specimens revealed that generally two types of blanks have been utilized for celt-making at Sulabhdihi.
The first type includes thick elongated blades and flakes (Fig.2:1-5), characterised by a prominent mid-rib on the dorsal surface, broad transverse distal end, broad and thick prepared unfaceted platform with angle variation from 110° to 125°, and triangular to sub-triangular medial cross-section. Their length, width and thickness fall between 29 and 14 cm, 13 and 7 cm, and 9 and 4 cm, respectively.

The second type of blanks include thick and broad transverse flakes (Fig.2:6-10), characterised by prominently curved bulbons ventral surface, prepared unfaceted broad and thick patform, the angle varying from 90° to 125°, and broad semi-circular to expanding distal end. In fact many of these appear to share some of the characteristics of Acheulean flakes (Riet Lowe 1945) produced by the so-called 'Victoria West Technique'. Even the preparation of some of the cores bears resemblance to certain extent with that of the cores of the above technique.

Hammers

A large number of pebbles of dolerite of various sizes, at times with rounded surfaces, also forms a part of the debris. These were brought to the site probably from the nearby bed of the Korapani stream for manupulating them as hammers for detaching thick flakes and blades from the cores as well as for the sbsequent celt-dressing operation. Majority of these pebbles exhibits battering marks on their ends. Their length, widht and thickness fall between 15 and 6 cm, 10 and 5 cm and 9 and 3 cm, respectively.

Waste Chips

The mass of waste chips resulted from manufacturing celts appears to form almost eighty percent of the total debris deposit of Mound-I. They include primary, secondary and tertiary falkes, which vary in length, width and thickness from 9 to 2 cm, 7 to 1 cm and 0.5 to 1.5 cm, respectively.

The Celts

As mentioned earlier, the debris deposit of this manufacturing site has yielded evidence for hundreds of broken as well as complete specimens of only semi-finished celts. Surprisingly, barring five stray specimens, all of them belong to the category of chisel. Among the five exceptional forms one is a semi-finished axe and the remaining four are adzes. Thus, the more appropriate term to describe this centre would be manufacturing site for large-scale production of semi-finished chisels.

With a view to understand the techno-typological features of these semi-finished chisels, a detailed analysis of 60 complete specimens was carried out. The study revealed that most of the specimens are narrow, elongated and thick (Table 1). On the basis of the profile of the cutting edge, the specimens may be kept under two broad categories, *viz.*. chisels with median cutting edge, and those with bevelled

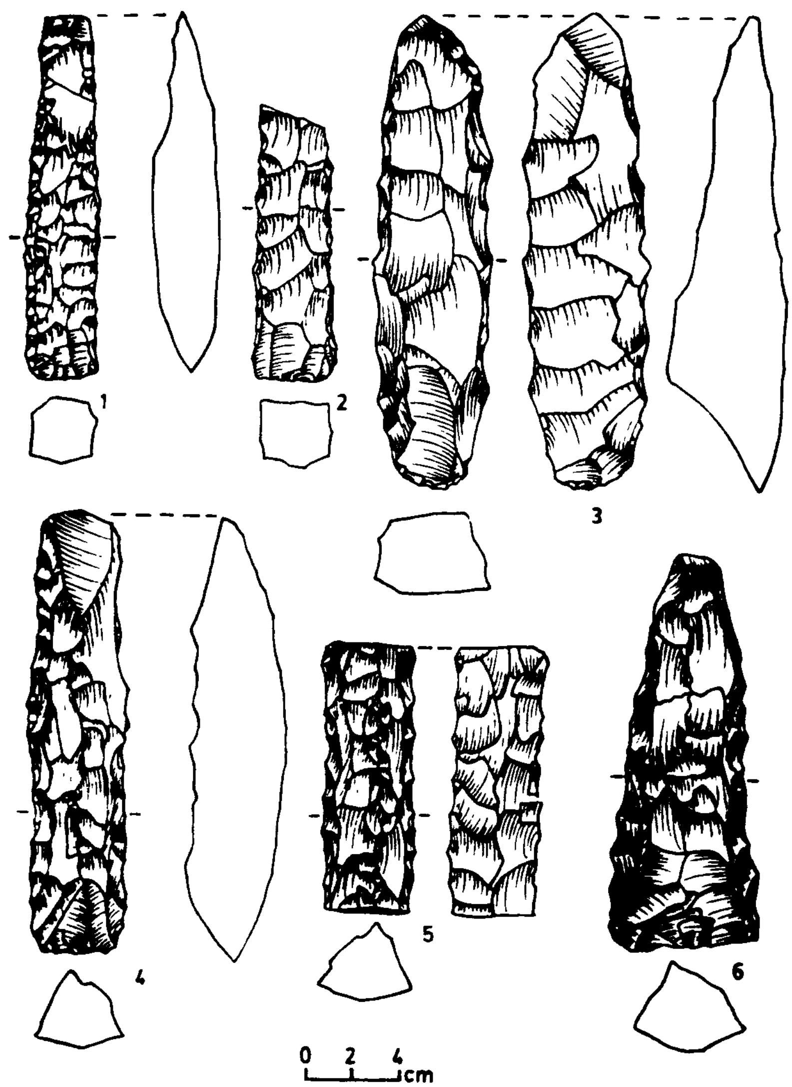


Fig. 3

cutting edge. Interestingly, 78% show bevelled edge while only 22% belong to the median variety. A large amjority of the chisels shows rectangulars to sligtly trapezoidal medial cross-section (83%), followed by triangular with equi-distant lateral sides (13%) and rhomboidal (4%). Similarly, 75% of the chisels are plano-convex in long-section.Butt ends are generally thick faceted or truncated (60%), although about 40% of the chisels exhibit thin-convex and bevelled butts.

The above account clearly indicates that the typical specimens manufactured at Sulabhdihi are thick elongated chisels, having rectangular medial cross-section, truncated or thin convex butt, plano-convex long-section, and bevelled cutting edge (Fig.3: 1-3). A large number of broken as well as unfinished chisels of this site also falls in the above category. It may also be mentioned here that while there is a solitary example of chisel with rohmboidal cross-section, a sizeable number of chisels of this site is characterised by triangular medial cross-section with equidistant lateral sides and bevelled working as well as butt ends (Fig.3:4-6). Techno-typologically they closely resemble Luzon and pick-adzes of Southeast Asia (Duff 1970). These specimen, though represented in low proporation, may be considered as very specialised tool-type produced at this manufacturing site.

It has been observed that selection of specific blank-type played an importnat role in the production of the above categories of chisels at Sulabhdihi. It is evident from the numerous partially worked flakes and blades as well as semi-finished chisells that generally the quadrangular-sectioned chisels were prepared out of thick and broad flakes, and the triangular-sectioned chisels out of elongated thick flakes and blades with prominent mid-rib on the dorsal surface. The above observation is based upon the study of such chisels as have retained, at least partially, the original ventral surface (Fig.4)

The above account of the artefactual composition of Mound-I clearly indicates that except the latter stages, *viz.* pecking and grinding of the surfaces, all the other stages of lithic reducaion were carried out at this site, starting from detaching blanks from the crores to the hammer-dressing of the chisels. It should be borne in mind that every site need not be necessarily a place where implements were manufactured and also used. In the present case it appears that only semi-finished chisels were produced at Sulabhdihi, leaving final pecking and grinding of the implements to the people who used them in their habitations and areas of activity.
Besides Sulabhadihi manufacturing site, several localities in the foothills and river bank areas of Bonaigarh have also yielded evidence for numerous small clusters of celt-dressing spots and a few habitation sites characterised by the occurrence of coarse-gritty red ware sherds and celts (Fig. 1). A large number of chisels have been recovered from these sites, where micro-shipping as well as grinding of the specimens were carried out. Unlike the Sulabhdihi site, in these cases not only the debris scatter is very small, consisting of only micro-chips, but there is also a general absence of other artefact categories, *viz.* cores, flakes and blades. A detailed techno -typological analysis of 48 complete chisels from these sites revealed that despite their comparatively smaller size (Table II), which might have been due to the subsequent micro-chipping of the semi-finished specimens and final grinding of the whole or part of the specimens, they hardly deffer techno-typologically from the quadrangular-sectioned chisels of the Sulabhdihi manufacturing site (Fig. 5). Surprisingly, not a single example of the triangular-sectioned chisel has been found in these localities.

Thus, the picture emerging from our study appears to suggest that the quadrangular sectioned semi-finished chisels from the Sulabhdihi were supplied to these localities of the Bonaigarh subdivision, where they were finally finished. Here, it may also be noted that many of these chisels of the small clusters exhibit lustrous surface or what is sometimes termed as polishing along the working edges, suggesting thereby that these chisels after being micro-chipped and ground were also put to use.

Discussion

It is evident from the archaeological investigation at Sulabhdihi celt manufacturing site that it not only adds an entirely new dimmension to the understanding of the neolithic culture patterns of the highland regions of Orissa, but the evidence also provides insight into the several aspects of the lithic production system of the neolithic craftsmen.

Our investigations also reveal that the southern part of the Bonaigarh subdivision has rich potentiality for neolithic researches. We could locate three types of neolithic sites in this region, *viz.* first, large-scale producation site, where semi-finished celts were manufactured in very large number and represented by the one at Sulabhdihi, second, more than one hundred small and medium sized clusters of stone chips mostly located in the foothills as well as nearby plains and representing the sites of micro-chipping and finishing of the neolithic celts, and third, a few habitation sites of the neolithic people mostly located close to the Brahmani. It appears that all the three sets of sites are part of one system and denote three sets of activities presumably of the same people. To elucidate the point it can be said that various groups or clans of the neolithic folk established their

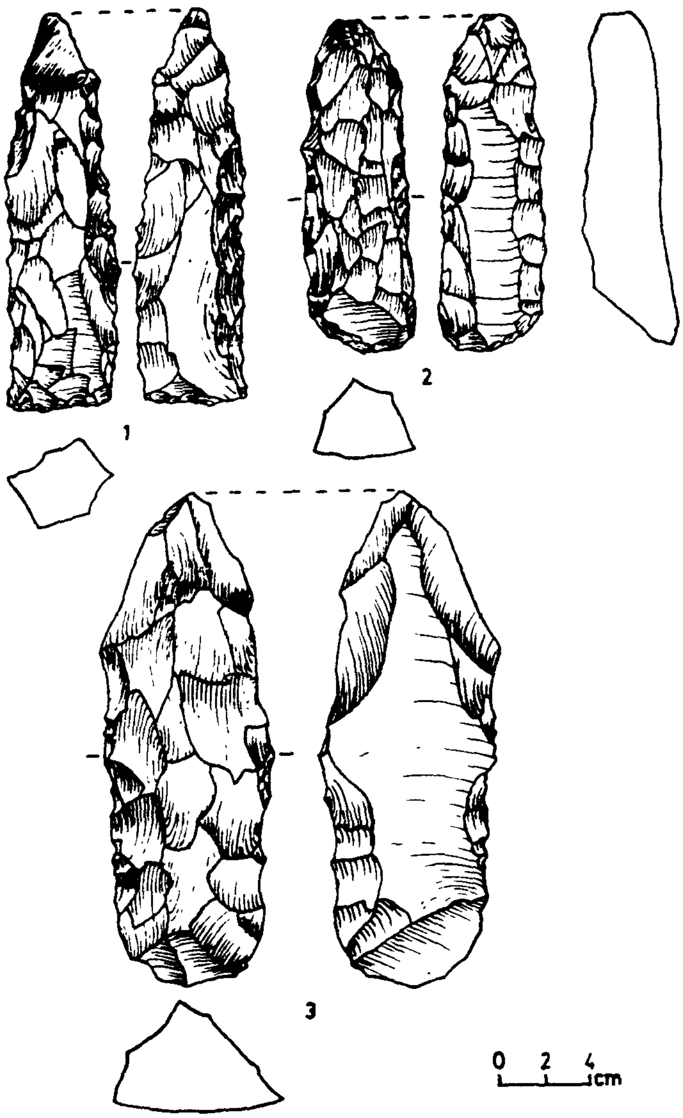


Fig. 4

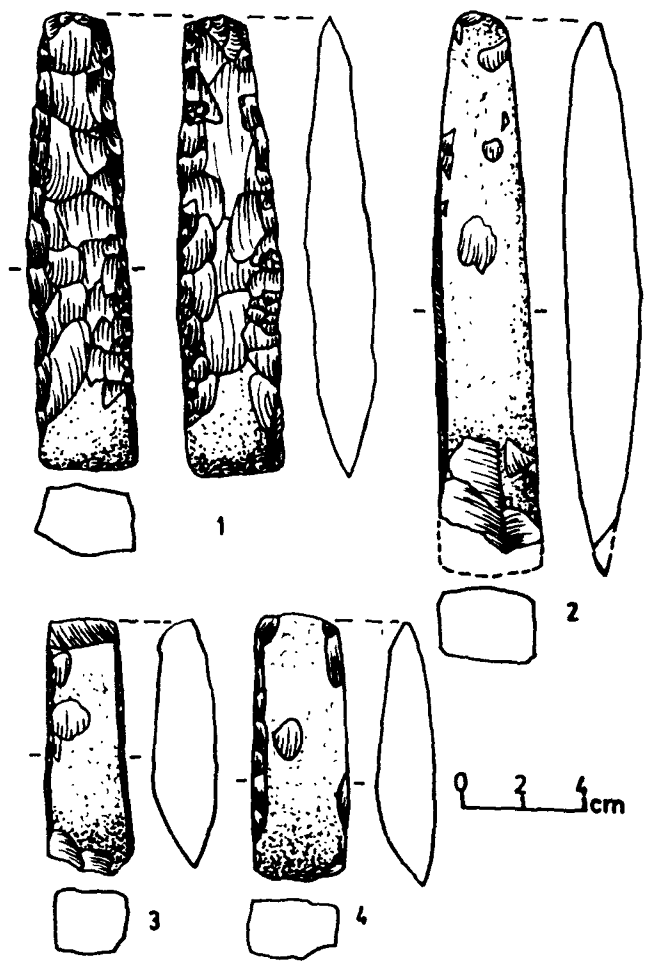


Fig. 5

small habitations in a particular ecological setting along the Brahmani where perennial water for survival, alluvial plain for agricultural operation, ample supply of fauna, flora and other forest products for subsistence and maintenance and required rock types for implement fabrication were freely available.

Howere, the above hypothesis fails to take into consideration the entire evidence available to us from the region. For example, as mentioned earlier, we have two major types of chisels from Sulabhdihi manufacturing site, *viz.* the one with medial rectangular cross-section and the other with triangular cross-section, the former being the dominant type. Then how is it that all the chisels found either from micro-chipping sites or from habitaion sites show only the rectangular cross-section. It is surprising that the other type is altogether absent from these sites. If the same people were also the knappers at Sulabhdihi then obviously both the types of chisels should have been found at the sites of the other two categories.

In view of these shortcomings, an alternative hypothesis may be proposed. It is possible that the tool fabricators of Sulabhdihi formed a separate group by themselves. They were either select group of people from among the neolithic population of Bonaigarh who specialised in too fabrication, or they formed altogether a separate group, who suplied one of their major products to the neolithic inhabitants of the region. In view of the available evidence, in either case the knappers of Sulabhdihi supplied their semi-finished chisels with medial rectangular cross-section to the local neolithic population, while they manufactrued chisels with triangular cross-section with an intention to supply them to their distantly located consumers. In the absence of any reliable published accouts of the neolithic cultures of other parts of Orissa as well as neighbouring states, it is difficult to identify these distant consumers with whom the knappers of Sulabhdihi might have had some sort of trade relation.*

Table - I

Semi-finished chisel descriptive statistics (Total No.60)

Variable	Size-range	Mean	S.D.	C.V.
Length	260-102	170.85	32.70	19.14
Width	90-27	52.00	12.82	24.65
Thickness	70-24	42.65	11.36	26.64

1. Measurements in millimetres
2. Standard deviation
3. Coefficient of Variation : C.V. = 100 x S.D. / Mean

Table - II

Finished chisel descriptive statistics (Total No.48)

Variable	Size-range	Mean	S.D.	C.V.
Length	172-73	112.75	24.53	21.76
Width	47-21	32.96	5.83	17.69
Thickness	41-16	24.48	4.85	19.81

1. Measurements in millimetres

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Art and its Creative Outlook

There are two disticnt approaches to art which may be compendiously described as aesthetic - critical and socio - historical. The former approach seeks to evalute the work of art as an aesthetic object, the latter as a social object. Since aesthetic creativity and social work are not separable the work of art is at once the result of creative imagination as well as of socially valued labour. A full consideration of the work of art consequently must in some sense combine two disperate sets of categories - value and utility, expression and causation, individual experience and social co-operation. Even in the simplest object of prehistoric art whether a cave painting or a terracotta figurine or ceramics, the two aspects are inevitably joined together. The artist fulfills himself while performing a social role, what he creates has some status as a useful object within the network of social functions but it goes beyond its instrumental character and also has an intrinsic value.

The awareness of this distinct intrinsic value of an art object has sometimes fostered the illusion that the mamimisation of aesthetic value might be achieved by its isolation from its instrumental or social functional aspect. Thus one could separate the art of decoration from the potter's art to a certain extent, but even undecorated pots have to have a diversity of forms which can hardly be concieved in a purely functional manner. Nor could decorative bands and designs be impressive in themselves without the limitations imposed by a background. A pure musical note may be given out by a tuning fork but it does constitute its musical richness. In other words the autonomy or purity of an art object is not properly constituted by its isolation from social or cultural context. It is this reason that the whole attempt to build a purely formal science of criticism can only end up in empty formalism or rhetoric.

The fact is that aesthetic value itself has two disticnt components - one lies in the skill with which the artist uses his resources. The other lies in the values-social, cultural, ideological - which the work as a whole expresses. Of these two components of aesthetic value the former could be called largely formal, the latter expressive significance. More strictly, the two aspsects of form and singinficance are combined by expressiveness which may be described as the essential characteristic of art. Thus *śabda, guṇa, riti, alaṁkāra* may be described as the formal aspects of poetry, while *bhava* and *rasa* are elements of its significance. The two are joined together by *dhavni* or *vyanjana*. Even in formal art like music while *svara* and *tala* constitute its body *raga* is more than these elements and along with *bhava* and *rasa* may be categorised as significance. It may be clarified, however that feeling or significance in music need not be of the same defined kind as in the verbal arts. It is truest of music, to adapt the words of Collingwood that its gives a deep sense of signficance without stating what that significance is. Similaraly it touches the heart but unless words are used or a conventional context is present, the feelings remain somewhat nebulous. The connection of aesthetic value with social function is made not only through the expressed signicance of the art object but also in terms of the social demand for challenge which it seeks to meet. It is not the case that if a society were to formally create a distinct leisured class of artist who were left totally free without any social demands than art would be best served while the excellence of art has no direct connection with social uses, demands and challenges, they do enter into it indirectly, Shakespeare produced his plays for a professional theatre but his plays sum up the conscious-ness of mankind. It was not merely ephemeral entertainment, not abstract formalism.

Thus, a proper approach to art should include a consideration of the form and significane of its expressiveness as well as a social and cultural context which complete

its being. A full approach to art must include a consideration of the rhythm, its structural elements, its expression or representation of reality - natural, human or superhuman - and value and finlly its human and social relevance.

Thus, if we compare the Besnagara Yakṣiṇī, the Sarnath Buddha or Bronze Nataraj of the Cola Age, they have obvious differences, not merely in their technique and form but in conception of the internal energy or being which is to be expressed in terms of outwrad form, One emphasizes massive dyamlism, another still repose, a third the vertual identity of dynanism and repose. They however differ not merely in their expressiveness and form but in their evocativeness with reference to their festive, meditative or ritual employment.

It is therefore, necessary to avoid the divide between the aesthetic and the historical. A merely aesthetic approach tends to imprss itself in unfruitful categories and the limitations of a coterie. We must remember that no criticism can limit itself within the boundaries of a single work of art. Willy-nilly, it has to make comparisons and import matters of social relevance. Similarly, merely social and histoooorical miss the hero in the play. In historiography of Indian art, this warning is specially needed, because while traditional criticism was largely formal, modern accounts rarely go beyond the most obvious facts of materials, techniques, themes and social use. They rarely seek to analyse the uniqueness of old works of art and the non-tormal or unusual features which give it excellence.

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ANUPA PANDE

A Unique Art - Relief From Ajanta

Following enlightenment at Bodh Gaya under the Banyan tree till his *Mahaparinirvāṇa* Siddhārtha (Better known as Gautama Buddha) preached the docrtrine of righteous path for the well being of humanity at large. The teachings of the Lord were called by his followers as Buddha Vacā. Still later the same was elevated to the status of Buddhist relion. It is still a debatable point whether image worship was in vogue during the life time of Lord Buddha or not. Some intellectuals opine that, image worship has its origin much earlier than the time of Buddha and in support of their theory cite the tradion of the two Great Hindu Epics Viz. 'The *Rāmāyaṇa* and *Mahābhārata*', which according to them are of still greater antiquity.

It is believed that Lord Buddha treated image worship as a taboo and he adhered to it strictly during his life time. According to *Mahāparinibbāna Sutta* on enquiry by his diciple Ananda, Gautama Buddha is said to have forbidden his followers from worshipping his physical form (Sarira) and ordained them to strive hard to achieve the goal of *Dhamma*. Buddha might have foreseen that after his death, worship of his mortal remains is inevitable and as such he cautioned them not to do so. His fear turned out to be true and after his corporeal relics (Mallas of Kushinagar, Ajātasatru, Lichchhavis, Sakyas, Bulis, Koliyas, Brahmins from Vethadipa and Mallas of Pava) erected stupas over these relics, beside one shūpa over the urn used on the process of distribution (by the Brahmin) and one over embers by the Moriyas of Pippalivana were also built (Mitra 1980: 7) a fter a lapse of time following the death of Buddha greater impetus was received for the erection of additional stūpas, particularly during the reign of Mauryan king Asoka. *Divyāvadāna* mentions that emperor Asoka was responsible for the erection of 84,000 stūpas over the portion of Buddha's mortal relics (Saririka) which he obtained from the original eight stupas by openig them (Joshi 1991:1).

Immediatey after the death of Buddha only the symbolic representation of the Tathāgata was accepted by his followers as portrayal of a specific event in the life time of Buddha. There are altogether eight such symbols of which stūpa occupies the most venerated place. The rest are *Dharma-cakra* (Wheel) *Chhatra* (Parasol), *Simhāsana* (Empty thrown sometime holding bejewelled turban or foot print), Tri-ratna (auspicious symbol-probably standing for Buddha, Dhamma and Sangha), Bodhi-tree (Banyan-tree), *Asthi-Kalaśa* (Relic-casket) and Pādukā (foot print). These symbols were often represented in

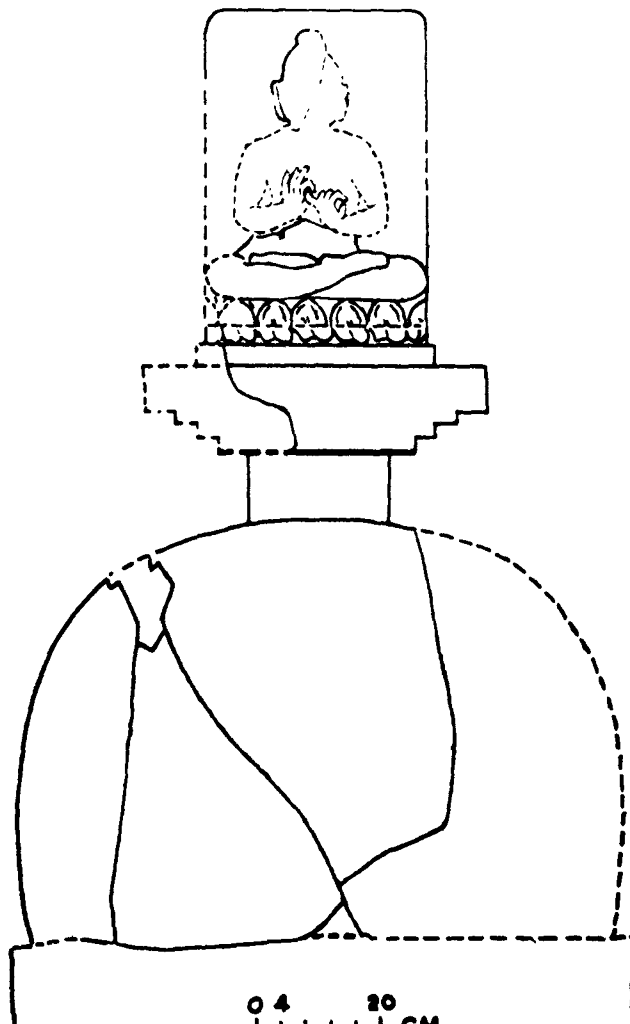


Fig. 1

combination of two and three (Joshi *et al.* 1972). Though symbolic representation was mainly adopted by the followers of Hinayana sect, portrayal of the same by the Mahayanists are also available in a large number of cases. Sites like Bharhut, Sanchi, Pauni and Amravati have yielded the largest number of such symbolc representations.

It is still a highly debatable subject as to when actually the first Buddha image came into being and where. While there are claims and counter claims still persisting, it is normally accepted that in all probability the first image on Buddha might have been introduced simultaneously at Mathura and Gandhara round about 1st Century A.D. But it is the foot print w hich first appeared as the personified version of Buddha and rightfully so observed by Joshi (1991:2) The movement for proper sanction in this regard seems to have taken shape during the fourth Buddhist council held in the reign of kushan king, Kanishka-I (Mitra 1980:12).

The Mahayanists who principally devoted themselves towards worshipping the image of Buddha have tried in a number of ways to accomodate the same and it seems in the beginning they have nevrer set a proper norm for its position in a given architectural plan. By and large he is shown seated over a throne or high platform in *pralambapāda* in *Dharma-cakra pravartana mudrā or* seated in *padmāsana* in *Dharma-cakra pravartana mudrā* or *Dhyāna mudrā* or *Bhūmispara mudrā.* All these figures are generally located inside the shrine of a *vihara*. Some of these can also be observed in the Deccan group of rock-cut caves in Maharashtra. In addition to these, average to very tall figures of Buddha are also seen excavated in these caves mostly standing with right hand positioned in *Vārada mudrā* or *Abhaya mudrā)* (Kanheri-3). In the Gupta and post-Gupta periods, Buddha figure appears in association with stupa at its. back. In these examples he is either seated in *Pralambapāda* (Ajanta 26 and Ellora 10) or standing in front (Ajanta 19).

A unique relief carving at Ajanta-remained unnoticed so far and stands in its mute testimony as to whether the authors of Mahayana sect tried to execute it in the beginning in a different manner or not. This is fine example of early Mahayana sculptural art executed in low relief in front of cave No.9 at Ajanta facing west to the left of the cave. Here the *Tathāgata* is shown seated on a double petalled lotus seat in *Dharam-cakra Pravartana mudrā* over stupa (PI-XXXII). The panel measures 1.42 m. in height and 1.04 m. mn maximum width respectively. Thus, it is likely that this might have been the first attempt to represent the Master in association with stūpa as we do not see second example of this kind anywhere eles. A pre-kushana sculptural representation from Mathura depicts Lord Buddha seated over a down pyramidal topped pedestal and could be the nearest to the present example thematically (Agrawal:108). Agarawal has dated it to 1st Century A.D. of transitonal phase.Similar dating is also provided by Czuma (Czuma 1986:37). In a yet another example from Shah-ji-ki-Dheri near Peshawar, now in Pakistan also calls for attention (Czuma 1986:32, fig.9). Though materially this copper reliquary differs in comparison to that of the Ajanta example, it certainly is not far from the same in its theme, as we know that a reliquary and a stūpa both symbolise the Tathagata. In this example Lord Buddha is shone seated over a padama in padmāsana in abhaya mudrā and dated to late Ist Centuray A.D.It is likely that the authors of this low relief work may have given up representing the Lord over the stupa to honour the sentiments of Hinayanists who may have continued to live at Ajanta side by side for a little more time if not longer.

In the present example an unfinished high raised hemispherical (app.98 cms. dia. and 64 cms. high) stūpa dome (aṇḍa) is visible with traces of *adhiṣṭhana medhi* (app.1.04 cms. wide) at the left bottom corner Similar *stupa* relief representation is noticed in one of the pillars upright excavated at the Hinayana site of Pauni, District Bhandara, Maharashtra. The plain *harmikā* is centrally executed and meausres 20 cms. X 10 cms. Over the *harmikā* is placed tervy down step pyramidal capital measuring 52 cms. X 13 cms. in width and height respectively with 04 cms. maximum length of each projected step on either side. Over this is placed a flat plain cushion measuring. 37 cms. in width X. 04 cms. in height repectively. Surmounted over this is a seated Buddha in cross legged position on a double petalled lotus. Considering the extant figure it is likely that Buddha might have been shown here seated in *dharma-cakra pravartana mudrā* (teaching -attitude only (Fig.1). Since the sculpture is too much damaged more deatails of this piece of art work cannot be determined clearly.

Before arriving at the conclusion it is better to understand as to why this panel came in association with rock-cut architecture and when? what could be its probable date?

As far as the first part of the question is concerned it is rather difficult to answer with any amount of certainty. Till date no evidence has come to light, either epigaphical or any other which could settle the issue. By and large a date of 3rd Century A.D. (later half) to 4th Century A.D. corresponding with Gupta period is assigned to the beginning of Mahayana phase at Ajanta and other group of caves in the Deccan. Besides, it can be seen that the dome is more

hemispherical than elongated, has proportionately a wider base to the height which are the features of early tradition of stupa construction. There is no other evidence elsewhere like this which could speak, of any tradition or school of thought for such representation. It seems at least at Ajanta the early Mahayanists might have been confused in finding a proper place for the figure of Buddha, and therefore tried in a different manner till they came to a decision for the shrine. It is unlikely to believe that sculptor was not aware of the normal ethics of art and architecture, because of its fine proportionate execution and maintenance of balnace in the present panel. Further, it can be said that the present panel may be the missing link for art historians, who claim that htere waas no period gap as such at Ajanta in the execution of a rt between the Hinayana and Mahayan phase (Thosar 1991). Besides that one must note that the occurrence of the panel is in front of cave No. 9, which is a Hinayan *Chaitya Gṛiha*.

It is difficult to say as to what actually the artist wanted to emphasise upon in the present panel, particularly by positioning the Buddha figure over stupa. One may believe that it could be the way by which the Mahayanists wanted to represent the phase of subordinating the Hinayanist which ultimately withered away in the Deccan. But logically this may not be true, as there is no evidence which can stand in support of this belief. There is no example to prove that the Mahayanists did any harm to any Hinayanists cave or their object of worship. It is only in a few instances in which later Mahayanists are found to have converted a couple of Hinayana vihara into Mahayana vihara : Nasik 20) Mitra 1980 169; Nagaraju 1981:275). Had there been a phase of hatred, one would never have observed a single Hinayana Buddhist chapel *(Chaitya griha)* in its complete form.

In view of the above it is just possible that such representations, though rare, are the outcome of a transitory phase before they got clearly defined with the all pervading iconographical Configurations of the Mahayana elements.

At the end it is better to examine as to whether the panel referred in this paper is complete or there are two separate panels. In this regard it may be pointed out that the panel is a composite one and product of a well coaeived and meticulously executed work. If it were to be two separate panels having been carved out on two different occasions, there would have been *Chhatra* (Parasole) in a diminishing tiers over the stups which is a normal practice. Under the circumstances the remaining portion of rock surface would have been lost to the later worksmanship, with the result that no rock surface would have been left to execute the cross legged portion of seated Buddha, the *Padma* (lotus) base and other anatomical details of the figure. Thus it confirms that the panel under study is single panel and un-paralleled piece of rock-cut art of Deccan India.*

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* Drawing and Photograph are reproduced by courtesy of the Archaeological Survey of India.

A Unique Inscribed Metal Sculpture of Padmapāṇi From Western Himalayas

The inintial aim of this communication is to focus upon an imposing metal icon of immense historical, archaeological and aesthetic importance representing Bodhisattva Padmapāṇi discovered by the authors in the autumn of 1991 at a remote site near Indo-Tibetan border in Himachal Pradesh(Pl. XXXIII). The well preserved image cast in brass (see Table.I,II) by wax process measures 95 c.m. in height and approximately 25 Kg in weight and bears an incised inscription in Tibetan script of early period on the pedestal. Stylistically and aesthetically this marvellous piece of art seems to be related with the classical phase of the medieval art of Kashmir which

permeated in the western Himalayas and gradually transformed into Weatern Tibetan art style. The sculpture itself is document of interaction of material culture between Kashmir and West Tibet. A preliminary reading of the inscription suggested by Amy Heller of Switzerland and Christian Luzcanits of Austria (during our discussions in Fagerines, Norway) estimates presumably three similar images commissioned by a noble man of Tibetan origin. We cannot, however,draw any conclusion unless the inscription is studied in detail.

As a work of art the image of Bodhisattva Padmapaāṇi far exceeds in aesthetic quality the average product of the school. Of similar aesthetic value only two metal sculptures of Kashmiri origin are known to us, first standing Gautama Buddha in the Cleaveland Museum of Art (Pal. 1975. pl.26) dating cir 900 AD and another Bodhisattva Maitreya in the Pan Asian collection (Schroeder 1981: pl. 20E) of the 10th century AD.

The Present deity gracefully standing in pleasing classical tribhanga against an oval pointed prabhaāmandala engraved with flames on a lotus pedestal presents an elegantly proportionate slim body with fascinating facial type. The oval sweet face marked with full arched eye brows, prominent nose, chubby cheeks, double chin, almond eyes and summarized sensous lips with hypnotic smile of eternal joy presents a close affinity with the art of Akhnur and Ushkur and its later development under the Utpalas in proper Kashmir. Similarly delicate but perfect plastic modelling of body particularly of the chest and abdomen highlights pulsating vibrtion of flesh which is a unique feature of the Kashmiri school developed after the Karakotas during the reign of Utpala Kings. The same penchant for naturalisic sensuous modelling is encountered in the sculptures of Avantipura dating 9th century and also in Verinag at slightly later date. Stylistical details of Padmapāani clearly establishes its provenance in northern Kashmiri style of 9th and 10th centuries. Kashmiri principalities of Gilgit, Baltistan and Swat remained strongholds of Buddhism under Dard Patola Shahi dynasty while southern Kashmir centered arround the basin of river Jhelum in the plains of Kashmir valley turned a fervid centre of Brāhmaṇical religion and art.

The northern Kashmiri art during the period of second spread of Buddhism in Western Tibet permeated into the Lahul and spiti (Postel *et al.* 1985 : 83-92). Tibetan historical records register the fact that for the establishment of Buddhist faith in Tibet Western Tibetan Kings invited Indian artists and scholars and gave them liberal commission to erect and decorate temples. Kashmir being adjoining country and its upper reaches being strongholds of Buddhism occupied most influential and prominent position in the task of restablishment of Buddhism in Western Tibet and surrounding regions in the Himalayas (Tucci 1973 : 93,140,142).

Comparing the example under discussion with published Buddhist bronzes of Northern Kashmiri origin certain features e.g. curling flame etched pointed *mandorla*, three pointed crown, thin plaits of hair falling over the sholders and classical ornaments relate this piece to the artistic tradition which was flourishing in the mountanous regions of Kashmir imbued with Iranian and Central Asiatic traits. A graphic synonym of the metal sculpture can be seen in the book covers of Gilgit manuscript representing Bodhisattva Padmapāṇi (Bannerjee 1968: fig.1&2) predated. Here, we can link Gilgit and northern peripheries of Kashmir with Ladakh where routes lead to Lahul, Chamba, Spiti and ultimately to Western Tibet. This is substantiated by the graphic evidences found on the walls of Budhist temples of Alchi and Mongyu in Ladakh, Mangnang, Tsaparang and Tholing in Western Tibet (Guge) Nako in Kinnaur and Tabo in spiti (singh 1985 : 30-42) which present an unbroken chain of artistic style that prevailed almost from 5th-6th centuries to 10th centuries AD. in vast stretch from Afghanistan to Western Tibet (Sinah *et al.*1992).

The sculpture manifests four armed non-tantric form of the Bodhisattva holding a rosary in rear right hand and a book in rear left hand while left front hand holds stem of lotus and front right hand makes gesture of munificence. A miniature image of Amitābha is carved in the middle of his crown and a hide of antelope lies on his left shoulder which ascertain his identification as Padmapāṇi Bodhisattva (Getty 1978 : 62).

With regard to copper alloys used in the image studies by Riederer, (1985: 69-72;1991:95-102); Dubrovin (1986:83-104; 1988:22-30; 1990:45-77); and Craddock (1981:1-32) are important and essential contributions in archaeometallurgy of the region.

The scientific and technical examinations of the sculpture have been considered in order to understand chemical pecularity and to establish alloy group as suggested by Dubrovin (1990). The methods for studying such images have been described by many scholars (Singh 1991).

The data acquired until now comprised the quantitative amounts of copper, tin, lead and zinc as main compounds and iron, nickel, silver, arsenic antimony, bismuth, cobalt, codmium and gold as trace elements (Table I and II) comparing the chemical compositions of the images of western Himalaya region. It has been observed that the term 'bronze' (like indo-Bronzes by Schroedar 1981) used commonly for the whole varreity of copper alloys is not correct. It has been proposed to use more precise terms on the basis

of the presence of other main alloying metals tin, lead and zinc. Hence, the metal sculpture under discussion comes to copper-zinc group that is 'Brass' of Dubrovin (1990) which is the largest in his selection. It was found that in the region of western Himalayas brasses with high amounts of zinc were used ranging between 11 to 21%. Tin is low with concentrations between 0.1 and 1%, lead has been reported between 0.3 to 3%. Iron is pretty high with concentrations between 0.5 and 1%.

The trace elements vary so that the brass sculptures from this region can be considered as a homogeneous group(Table-II). There was very early tradition of manufacturing pure brass in these areas. Chemical compositions show remarkable differences from other Tibetan objects resembling brass images of Kashmir and Ladakh (Dubrovin 1990). It has been observed that the craftsmen of these areas were using simplified methods of plaster casting employing reusable matrices or the method of lost wax process. The evolvement of local casting traditions was primarily dependent upon the availability of necessary raw materials and it is evident that for total absence of deposits of tin in the area few images of tin bronzes have been recovered (Craddock, 1981: 1-32).

On the basis of the stylistical, the iconographical and also the scientific study, a date can be ascribed for this brass image as 10th century A.D. when Buddhist Kashmiri art was making a shift towards north-east in upper regions of western Himalayas and Western Tibetan provinces

Table - I

Chemical compositions of some Bronze Images from W.Himalayas

Elements	1	2	3	4	5	6	7
Cu	77.10	77.27	76.71	86.38	84.53	82.17	80.39
Sn	0.25	0.26	0.11	<0.20	2.57	0.47	0.28
Pb	0.51	0.47	0.36	1.43	1.43	3.69	0.22
Zn	20.25	19.80	21.37	16.33	19.33	19.92	18.27
Fe	0.77	0.82	0.57	0.66	0.66	0.92	0.49
Ni	0.05	0.04	0.03	0.04	0.04	0.08	0.05
Ag	0.09	0.07	0.08	0.05	0.05	0.010	0.04
Sb	0.06	0.04	0.05	0.09	0.09	0.67	0.11
As	0.92	0.87	0.72	1.02	1.02	0.52	0.15

Sample Nos. 1 and 2, present analysis(10th century AD); Nos. (1050-1150),4(1150-1250),5(13th century) No.6(1250-1350 AD)and No.7 (13th-11th century) all obtained from West Tibet analysed by Rathgen,ref: Schroedar, 1981:50-51

Table - II

Concentrations of Trace Elements

Proveniance	Date	No	Fe	Ni	Ag	Sb	As	
West Himalayas		11	9	0.50	0.39	0.04	0.02	0.89
West Himalayas		12	6	0.26	0.11	0.06	0.03	0.71
West Himalayas		13	9	0.77	0.12	0.06	0.13	0.33
West Himalayas		14	8	0.48	0.11	0.06	0.18	0.48
West Himalayas		15	9	0.60	0.13	0.05	0.14	0.42
West Himalayas		16	6	0.60	0.27	0.04	0.03	0.41

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Saving a Great Asian Empire

In its heyday some 4,500 years ago, the city of Moenjodaro in what is now Pakistan rivalled its contemporaries in Egypt and Mesopotamia, now Iraq. About 450,000 people lived in its 300 hectares, more than twice the population of the Mesopotamian city of Ur, the second largest at the time. "They were excellent engineers," says German archeologist Michael Jansen, who has been studying the ruins since 1979. Some of the structures were more sophisticated in design and construction than those the Romans built 2,000 years later.

Moenjodaro was the capital of the Indus Civilisation, which once covered most of present-day Pakistan, stretching north to Kabul and as far east as Delhi. But one of the world's greatest archeological terasures is now at risk. Despite an international conservation plan approved in 1979, the excavated structures are turning to dust. At an international symposium two months ago, many scientists laid the blame on alleged mismanagement by Pakistani officials.

The Indus Civilisation comprised Moenjodaro, the city of Harappa and more than 1,000 smaller settlements. The ruins of Harappa were discovered in Punjab Province in 1921. It is the more vulnerable site because of its location. The 50 km of walls and other structures so far unearthed are thr ened by salt, which seeps into the bricks through gr..dwater and crystallises. The expansion causes the bricks to flake and sometimes explode.

The problem has grown worse. Intensive irrigation and lack of proper drainage systems prevent excess goundwater from getting flushed away, says Richard Hughes, a consultant with UNESCO, the U.N. Educational, Scientific and Cultural Organisation. Fortunately, Moenjodaro's still-buried areas - some 90% of the city- are not as seriously affected. Pakistan's Archeology Department has banned all major excavations. UNESCO has designated Moenjodaro as a World Heritage Site and contrubuted $7 million to help preserve it. Pakistan has spent an additional $5 million.

The international blueprint, which includes a five-year conservation plan, was discussed in a 1973 world conference. Under pressure from aid donors, Pakistan finally convened a second meeting in February. It turned into a gripe session. After eleven years of implementing the five-year plan, archeologists complained, only 30% of the needed work has been completed. the targets of their ire were the government Archeology Department and the autonomous Authority for the Preservation of Moenjodaro.

The Authority has dug a ring of 26 drainage tube wells around Moenjodaro to protect the ruins. The system aims to keep the groundwater level ten metres below the surface. Experts estimate that each well must pump at least 80 per cent of the time for this to happen. But electricity costs are expensive at some $32,000 per month.

Authority of 100 archeologists and other guests around the drainage works. The pipes gushed water into already brimming canals. But scientists who frequent the site say it was just for show. Says a Western archeologist:

"Every time I've visited unofficially, the pumps have been turned off". Authority chairman Abdul Kadir Shaikh says his office is only a coordinating agency, so he doesn't know whether the pumps are turned on or not.

Salt is not the only threat. Melted snow from the Himalaya causes the Indus River to rise about sixteen metres in winter. The Authority constructed dikes to hold back floods. But to the dismany of archeologists, the limestone it used to stabilise the earthwork was quarried in the Rohri Hills, site of the remains of tool factories that supplied the entire Indus Civilisation. The ancient workshops were destroyed. Authority officials say they are not concerned about a site 160 km away. Insists chairman Shaikh: "It's not my responsibility".

The Preservation of the Indus Civilisation's legacy should be the concern of everyone. The great city of Moenjodaro is treasure trove of information about life in ancient times, says archeologist Jansen. "And we're just beginning to learn about it"

From Asia Week Hong Kong April 10. 1992

BOOK REVIEWS

Dilip K. Chakrabarti, *The Early Use of Iron in India,* Oxford University Press, Delhi, 1992, pp. 200, Price Rs. 300/-

The emergence of iron in India and its popularity in every day life of the people elicits have the two major problems of Indian archaeology on which long debate has taken place. Before Chakrbarti, N.R. Bannerji had written a Ph.D. thesis on the subject but he could neither define the problems nor could solve them. The greatest merit of Chakrabarti's book is that he has looked at the problems in a very logical fashion starting with historiography and distribution of iron ores and then take us to the existing archaeological evidence and its nature, divided into a dozen zones. He then dwells into the technical studies of ancient iron objects as well as dates the Pre-Industrial Iron-Smelting Traditions and picks up the literary sources and analyses them in the light of archaeological data. His study shows that most of the European archaeologists like D.H. Gordon and R.E.M. Wheeler had certain amount of prejudice since they could never reconcile with the idea that iron in India could be older than 600 B.C. Chakrabarti has convincingly demonstrated that the antiquity of iron in India may go back to 1200-1300 B.C. and that the technique of iron smelting emerged from the technique of copper smelting. He has collected valuable data to show that in many parts of India iron smelting had already started during the time of chalcolithic/copper age. His analysis of the 19th century literature on Pre-Industrial iron in India is very significant and helps us in knowing that the British noticed their furnaces, Indian iron and steel was in great demand in West Asia from at least 600 B.C. to 1000 A.D. We have ample literary evidence to prove it.

The present book has been welll written, nicely printed and beautifully brought out.

S.P GUPTA

148, Vigyan Vihar,
New Delhi.

B.M. Pande. *Puratattva Prasang* (in Hindi), Swati Publications, Delhi, 1992, pp.90, 36 photographs and line drawings, price Rs.200/-.

The book comprises a collection of five articles of the author which have been published before in Hindi magazines - *Dinman* and *Saptahik Hindustan.* With the addition of some new material including references and notes the articles have become more useful for researchers and those who are interested in further study of the monuments described therein. Although four articles describe different types of monuments - the Śiva temple of Bhojpur, Bhopal reservoir, Indo - Portuguese monuments of Goa and Parsi remains of Div, the article on Bhopal reservoir contains informations about a number of such reservoirs or tanks of historical importance in the country. The second article in the book which is different in style from the others is on the mason marks of different periods and the author has marshalled available informations about interpreting them in their context. The author has made a special study of the marks of masons imprinted on temple walls, lintels and steps of tanks. He has taken samples of almost every genre of the temple art, both of the north and South India. He has collected and studied as many as 1321 such marks and about, 60 names found in the Śiva Temple of Bhojpur. This glyptic art of the mason, though never conventionalised in full form has possibilised new area of research. The illustrations formed of line sketches in the book and photos of edifices of Goa and Div island are particularly interesting, even as the edifices themselves which had a major impact in the region.

The book is not only a welcome addition to scholarship but a key for the general reader to know about such aspects of archaeology and monumental heritage of the country which have not been discussed as much before e.g. the Parsi remains of Div. The author has not only given details of the monuments but has also discussed the tradition and their modalities into classical continuity elaborating each technical term of the conventional form. The author has consulted proper authorities of the subjects and has paid full attention to pronunciation of the technical terms, particularly in regard to words of exotic origin.

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New Delhi.

Amar Nath Khanna. *Archaeology of India: Retrospect and Prospect.* Clarion Books, New Delhi,1992, pp. 280 14 colour plates and 52 black-and-white illustrations, including line drawings, 2nd ed. price Rs. 450/-.

In India, archaeology as an organized discipline began as early as 1861. Yet, apart from the Annual Reports and scholarly Memoirs of the Archaeological Survey of India and stray articles in research journals, it was only in 1939 that India Society, London published a book revealing archaeology: (a) launching in 1953 of a new annual publication called *Indian Archaeology - A Review*; and (b) celebration of the centenary of the Archaeological Survey of India. As a result of the former, a full account of Indian archaeology, covering also the activities of the states and the universities, began to be published on an annual basis, while as a consequence of the latter, an updated progress of the work was published as a special number of *Ancient India*, the Bulletin of the Archaeological Survey of India, besides a separate book titled *Story of Indian Archaeology*. Both these events proved to be catalysts as far as writing on Indian archaeology was concerned. From then onwards many books on the subject began to be written necessitated by the accelerative rate at which fresh knowledge was being added each year through field-work carried out by the Archaeological survey and various universities and research institutions which had by then also joined the fray.

Against the background of this accessible researched material we may review the book by Amar Nath Khanna, which is a revised and enlarged edition of his earlier one published in 1980. The justification of the second edition lies admittedly as much in the rapidly expanding horizon of Indian archaeology which calls for an updating and revision of the existing knowledge at least every ten years if not earlier, as, perhaps equally, in the demand which the first edition had created by its purposefulness, for which the credit goes to the author. At the outset, therefore, we may affirm with a sense of assuredness that there is much that is new in this edition which the reader would find useful. The book is intended for the young student of archaeology and the general reader who has an enquiring mind about the cultural heritage of India. The facile style in which the book is written and the sequence of chapters fully serve the purpose in making this effort fruitful.

The book is divided into four principal chapters, each dealing with history of Archaeological Pursuits, Highlights of Indian Archaeology, Important Excavated Sites, and Future Prospects, supplemented by a portfolio of illustrations, Appendices, Glossary, Bibliography and Index which justify the table. In the first chapter, the author brings the story of archaeological pursuits upto 1991, spanning a period of 130 years. Normally, such an account does not appear in books on Indian archaeology. As such it is a very valuable contribution, providing as it does, the background to the archaeological scene in the country. In the post-independence period, significant landmarks in the development of archaeology in India were the recommendations of the two Review Committees, set up by the Government of India, respectively in 1965 and 1983, the former headed by sir Mortimer Wheeler and the latter by Ram Niwas Mirdha. What is lacking in the account is the impact these recommendations have made towards enhancement of the quality of academic output and effective preservation of the cultural heritage, considered to be unsuspassed in sichness and variety. It is nearly a decade that Mirdha Committee's recommendations were accepted by the Government, which the author has quoted extensively for the reader. Time is ripe enough now to assess the results of their implementations to make oneself easy on that score as to how far the objectives behind the recommend datears have been realized. Without this additional input, the story remains some what incomplete. In the chapter dealing with Highlights of Indian Archaeology, the author has admirably summarised the available evidence from prehistoric to historic period. He has also added conservation in this account wherein he talks about the concepts and principles of conservation as also the inadequacy of the infrastructure in the country. While this is a welcome addition to the existing knowledge, we would have liked to know the application of these principles on monuments in India, at least on monuments listed on the World Heritage. Without this vital information the statements seem to exist in splendid isolation. One misses this information particularly because India has a commendable record in the discipline of conservation of monuments.In the chapter dealing with Important excavated sites, the author has given summary account of over fifty excavated sites. All these accounts are admittedly faithful, for the author, wherever necessary, has quoted from the writings of the excavators themselves. One of the merits of these summary accounts is the sitewise bibliography, giving published references of the site in question which is a very handy reference tool for general readers and specialists alike, desiring to know further details about the excavations. Although the choice of sites for such an account is very difficult, involving a discretion as what to include, one would certainly have liked to include a neolithic site in north-east or east India and one or two megaliths from Vidarbha and south India. The last chapter, dealing with present undertakings and future prospects, is very useful addition to the book, for it gives the reader an idea about the existing infrastructure as also the challenges which Indian archaeology faces today. To further add to the value and usefulness of the book, the authour has included. under Appendices, the archaeologi-

cal fieldwork done in Pakistan at Mehrgarh, Harappan sites, and chilas and conservation work in Afghanistan at Bamiyan. The author rightly deserves our thanks to make this material which admittedly has a great relevance to Indian archaeology accessible to the Indian reader.

It must be admitted that the book contains well documented resource material which can be profitably used by the specialist and the student alike.

342, DDA Flats, Hauz Khas, New Delhi. B.K. THAPAR

Pushpa Prasad. *Sanskrit Inscriptions of Delhi Sultanate 1191-1526.* Oxford University Press, Delhi, 1990, pp.239, Plates 18, Price Rs.200/-.

The work mainly enfolds 124 Sanskrit inscriptions or their variants in local dialects in Nāgarī Character. Their range is the end of the 12th Century and the beginning of the 16th Century A.D. The inscriptions are all from Delhi and Uttar Pradesh. A better thing it would have been to incorporate all contextual epigraphs in it to fulfill the historical necessity of a broader comprehension of the subject. Collection of all such wanted inscriptions in a collective work of this nature must be of definitive involvement.

The author has nicely elaborated different viewpoints of scholars who deciphered the epigraphs or anotated them in their cultural perspective. The short notes of the author are important for the proper context of the findings. The photographs of seventeen inscriptions published in the book are precisely clear, although some readings need emendation, particularly such as are accompanied by their snaps,, e.g. Basti Copper Plate Inscription (no.67 of Uttar Pradesh) comparable with facsimile. It has in its sixth line: *Sajala - Sthala - Sāmra - Samadhūka - Chatuḥsimā vachhinnam,* which has been wrongly read as : *Sajala - Sthala - Sāmra - Saptadhaka Si(Sī) māvachchhinam.* The word "Saptadhaka" translated as "seven kinds of breeze" is a *miscue.* The fact is : while describing the four boundaries of the village having land, water and mango-groves on its three sides, the fourth side is said to be with Madh"uka or Mahua *(Bassia Latifolia)* groves.

The book along with its two standard appendices and a select bibliography will be found useful. We would wish the author to rectify the printing mistakes in the next impression and such textual error as in the date of the Naraina Stone Inscription (no.10 of Delhi) as 1348 but which is rightly given as 1384 in translation.

Archaeological Survey of India, New Delhi. B.R. MANI

Neelima Vashistha. *Sculptural Traditions of Rajasthan* Publication Scheme, Jaipur, 1989, pp.256, Pls. LXXVI, Price Rs.875/-.

Many papers have been published on various facets of art and iconography of Rajasthan by both Indian and foreign scholars. In the present book an attempt has been made by the author to study pre medieval and medieval Brahmanical stone imagery (with special reference to key temple sites) in the contemporary cultural background of Rajasthan. This had led the author to define sub-regional variations, although the sculptures have followed the canonical texts. Man has always used images to bring the invisible realm of the spiritual and divine beings within the range of perception. According to professor H.D.Sankalia "Indian sculpture is rarely found alone, it had to serve architecture chiefly as an ornament of the latter". After the Pratīihāras, Paramāras, Chauhānas, Gurjarā-Pratīihāras and Guhilas had established their principalities in different parts of Rajasthan which subsequently resulted in various schools, influenced by geographical, ethnological and cult factors flourishing in an atmosphere of peace and tranquility. This resulted in construction of splendid temples by rulers, donors and devotees alike.

The book is divided into eight chapers. The influence of geographical, historical and religious background in the temple building activity has been discussed in the first chapter. Different main temple centres like Osia, Buchkala. Kiradu, Chittaurgarh, Kalyanpur, Nagda, Unwas, Jagat, Tusa, Iswal, Chandravati, Jhalarapatan, Kansua, Abaneri, Harsha, Neelkanth, Bayana and kama etc. have been described in the second chapter. The third and fourth chapters deal with Vaishṇava and śaiva themes. The sculptures pertaining to śakti cult have been tackled in the fifth chapter while syncretistic images are discussed in the seventh chapter. The last chapter deals with the scheme of temple decoration. Though the religious themes exhibit variations but the temples are adorned with a common sculptural pattern. In the end is given a comprehensive bibliography including literary, epigraphical and archaeological sources. The plates are excellent and printing errors almost absent. Many important speciemens from different temple sites and museums have been reassessed with a fresh look and without any prejudice. For this purpose scriptures and inscriptions have been carefully exploited. A few little known sculptures from Neelkantha, too, have been illustrated and examined. The general observation of the authour that Vāmana images are fewer than Trivikrama (p.72) does not appear to be applicable in Vāgada area in view of reversed proportion of these icons. The fish associated with tantricism was a favourite motife of the Paramāra artist of Vāgada. Another popular scene of Rāmāyaạ was the depiction of Lakshamana lying unconscious with his elder brother

Rāma and Hanumāna bringing medicinal herb to cure him. In the chapter on Decorative scheme the reviewen would like to add that Rajasthan could boast of retaining the earliest example of dhvaja-purusha in Ghaṭesvara temple, Baroli (although similar speciemen is also found on Ajanta Cave No.6, as informed by shri M.N.Deshpande and shri R.Sengupta). This device is found in many temple sites like chittaurgarh, Nagda and Arthuna etc. for providing the flag staff.

This book will be useful to both scholars and students interested in the heritage of Rajasthan.

Archaeological Survey of India, Jaipur. P.K.TRIVEDI

K.V. Raman (ed.). *Excavations at Uraiyur (Tiruchirapalli) 1965-69.* University of Madras, Madras, 1988, pp.i-vi and 1-110, Fig.25 and Pl.35, Price Rs. 150/

The excavations at Uraiyur were carried out for four seasons (1965-69) under the direction of T.V. Mahalingam to confirm the chronology and sequence of the early material culture obtained by him in his explorations in the lower Kaveri Basin and estuary at Kaveripattinam. The present report embodies the result of the excavations in eight chapters and three appendices which are written by different authors. In highlighting the significant achievement of the ancient Tamils of Karur and Uraiyur, the Chera and Cola capitals K.V.Raman and his colleagues have skillfully revealed the past on the strength of intensive archaeological research.

It is asserted that the excavations at Uraiyur have not only succeeded in achieving its objective but also contributed more to the existing material culture remains of the early historical period.

The cultural sequence at the site hints at the chronology of the site. Period I is characterised by seven potterry typees, viz. Black and Red ware, Black Ware, Red slipped ware (thin variey), Brown slipped ware, Russet coated and painted ware, Coarse red ware and Rouletted ware. Period II A claimed to be medieval in date on the basis of pottery types, shows survival of early historical pottery.

Period II B is late Medieval cuttings from URY- to URY-11 have been briefly described, supported by some important sections and plan drawings and photographs. However, there is a descripancy between Drawings and Photographs. For example, the description of layers of URY-1 (p.15) does not coincide with the drawing (Fig.3) and photograph (Pl.2). Similarly, the layer description of Ury-2 accounts for five main layers (p.18) but the photograph (Pl.4) shows eight layers.

Though URY-3 has been claimed comparatively less disturbed by the excavator yet he has failed to build up a comprehensive chronological framework for the site. The excavator has rightly compared the evidence with the one noted at Arikamedu, and it would have beenre warding to get other ancillary structures associated with it.

The chapter on pottery is merely descriptive. The report also embodies descriptive notes on inscribed and graffiti marked sherds. In all twenty sherds with Brāhmī inscriptions which have been unearthed are assigned to Period I. Likewise, sixty-nine varieties of graffitti marks illustrated in the report are largely common with exceptions to their peninsular sites.

Among the other artefacts the report deals with terracotta beads, glass, shell and bone objects. In the absence of palaeobotanical samples the plant economy at the site cannot be worked out. Similarly no bone sample has been studied in order to understand food habits of the people and faunal remains of the region. The occurrence of considerable number of beads and bangles may not qualify the site to be a manufacturing centre as claimed (p.104), since no unfinished/semi-finished or waste products of these items have been reported from the site.

The over all quality of production is good but it is not free from misprints. The photograph of the sculpture depicting the cock attacking an elephant appears prominently on the jacket of the report and also in Plate 1 of which there is no description in the report. Instead a relevant illustration could have been accomodated.

However, the work has its own merit. It provides some valuable information on the archaeological past of Uraiyur which once flourished as one of the important trading centres in the lower Kaveri Basin. Thanks to Prof. Raman and his colleagues for bringing out the present report which was in fact a long over due.

AMARENDRA NATH
Archaeological Survey of India,
Nagpur.

Dilip K. Chakrabarti. *Ancient Bangladesh - A Study of the Archaeological Sources,* Oxford University Press Delhi, 1992, Price Rs. 275/-.

The present book has been well written, nicely printed and beautifully brought out. by an Indian to bring together at one place the archaeological data on the pre-Historic and Early Historic cultures of Bangladesh. It is divided into five chapers: first is divided into three parts (a) Geographoical background (b) Ancient Historical Geographical Units (c) A Brief Review of Archaeological Research in Bangladesh. Chapter Two/deals with the archaeological remains of early historic periods taking into account the archaeological remains of Mahasthangarh, Patharghata, Halud and several other pre-Gupta, Gupta and post-gupta sculptures, inscriptions and architectural remains. Chapter Four deals with Buddhist stupas, moasteries and Hindu temples. The material is enormous and it goes to the credit of the author that he has been able to condense the entire data within 200 pages. There is a good appendix by S. Dara Shamsuddin and M. Shamsul Alam entitled 'Depositional Environment of the Palaeo-Archaeological Site of the Lalmai Hills, Bangladesh.'

148, Vigyan Vihar, New Delhi. S.P. GUPTA

Ajay Mitra Shastri (ed.). *The Age of The Vākāṭakas,* Harman Publishing House, New Delhi, 1992 pp.308 with 72 illustrations, price Rs.800/-.

In the mid-forties when in 1939 the Basim grant of the Vākāṭaka ruler Vindhya śakti II was discovered and published in the *Epigraphia Indica* (EI XXVI:pp 137 f.) by V. Mirashi, none could have thought that within three decades of its release would bring out his "Inscrisptions of the Vākāṭakas" as the fifth volume in the series of the *Corpus Inscriptionum Indicarum*, published in 1963. That book turned out to be his *opus archivio*.

Perior to Mirashi severel major scholars as Bühler, Fleet, Kielhorn and many modern interpreters Bhandarkar, Altekar, Majumdar, Nilakantha Shastri and Sircar have worked extensively to reconcile with older theories and suggest new beginnings. We are glad that their efforts have accomplished the new envisagements.

The present work outlines the history of the Vākāṭakas, in succession of the Āndhra-Sātavāhanas and Kṣatrapa rulers of Deccan in their contemporaneity of the Gupta sovereigns ramifying into collateral dynesties whenceforth new data appear to englobe the origin and ethnogenity of the Vākāṭaka race. Their political status, contribution to economic and cultural life and the study of the Vākāṭaka inscriptions, discovered after 1963, about which the editor writes:

These records have given us the only date for Rudrasena II, narrowed the gap in the shifting of the capital of the main branch from Nandivardhana to Pravarapura helped us in locating Padmapura in the Nagpur-Wardha region instead of in the Bhandara District as believed hitherto, brought us nearer the solution of the riddle concerning the succession after Rudrasena II, thrown fresh light on the reigns of Narendrasena and his son and successor Prithivishena II, given us the only known śaka date for Devasena which now forms the sheet-anchor of the chronology of the vatsagulma branch and supplied the hitherto, unknown name of Devasena's father, father, viz. Sarvasena II, and names of two of the officers of Harisheṇa, the last known member of the vatsagulma branch of the dynasty. We have, for the first time, the seals attached to the copper-plate grants issued by Prabhāvatī - guptā during the reign of her third son pravarasena II, and those of Prithivisheṇa II last known member of the main branch of the family. In addition to these facts mainly relating to political history we also get a good deal of information on the cultural history of the period.

Papers mainly draw on "The Vākāṭakas", "New Vākāṭaka Inscriptions" and "Vakaṭaka coins" (Shastri:1,21,24), "Location of Rāmagiri of Kālidāsa (Bajpai:10), "The Achievement of Ajanta" (Spink:17), "Pounar under the Vākāṭakas" (Gupta:113), "Administrative Divisions under the Vākāṭakas" (Mahajan:9), "The Progress of Vākāṭaka Historiography" (Goyal:Appendix) and "Some unique Representations of Śiva of the Vākāṭaka Period" (Sarma:20).

The work is rich in bibliography, pictorial content and reproductions of drowings and contour maps.

A few leitmotifs that require fresh outlook are such as the identity of the Kuntala country and Kadambas as its overlords and the controversy to ascertain the Vākāṭaka - Kadamba and Vākāṭaka - Gupta nexuses. Discussions binning diverse conclusions on the "home of Kālidāsa" to favour Ramagarh in the surguja district and Ramateka hill Nagpur to substantiate the identification of Ramagiri in the *Meghadūta* where the tormented yaksa lived during exile relate the same kind of helplessness.

Kālidāsa has not been discussed in detail as a poet or playwright and authors of the some *appaiare*, Bhāravi, Bhaṭṭi and Dandin and Diknāga, founder of Medieval

Indian logic, who belonged to the country of the Vākāṭakas have not been discussed, B.N. Mukherjee's article on "A Note on the Original Habitat and Kingdom of the Vākāṭakas" does not establish any thing and A.P. Jamkhedkar finds hard to translate Vākāṭaka Inscription in Kevala Narasimha Temple (on p.162) to enable one to find substance in it.

In interpretative terms of textual criticism based on the Pāli and Sanskrit Buddhist texts. There is scope for scepticism about the iconography of Dīpaṅkara in the art of Ajanta (supposedly depicted in caves 19,17 and 11). However, we find Śiva clearly identified in the Mansar image by I.K. Sarma who rightly repudiates S.B. Deo, R. Singh and Sara Schastok who had mistaken the image to belong to the class of Kubera or Yakṣa (Sarma: pp.219-221). The book must open new possibilities for research and interpretation.

Highland Cottage, Mussoorie. C. MANI

Anupa Pande. *A Historical and cultural study of the Natyasastra of Bharata.* Kusumanjali Prakashan, Jodhpur, 1991, pp.340, Rs.350/-

Although the Nātyaśāstra of Bharata is a well-known text, much work still needs to be done on it to elucidate its concepts and precepts as well as to analyse its social and historical aspects. The present study by Dr. Anupa Pande undertakes the task commendably.

In the Nātyasāstra the various arts meet in the theatre and find their inner unity in the concept of rasa in which aesthetic and social values coincide. The approach of the present study is distinguished by its socio-historical orientation which treats technical categories as congealed social categories, its focus on musicology and its analysis of aesthetic and social values. It begins with the discussion of the date of Bharata's work, describes the architecture of the Bharatan theatre utilizing archaeological evidence, goes on to the theory and practice of drama, considers the geographical horizons and material culture reflected in the text, and then gives a detailed analysis of social life as may be gleaned from it. After a chapter on Dance, the book then goes on to deal with music at length in five chapters and concludes and concludes by discussing the concept of rasa and the foundation of Bharata's aesthetics.

It is a thorough and painstaking piece of research which delineates the social back-ground of the text admirably. In elucidating the text it uses the abhinavabhārati and for the first time gives a detailed analysis of the system of music in Bharata. How exceedingly difficult the task is, hardly needs to be explained to those who are competent in the field. The study shows the technical competence of the author as well as her knowledge of Sanskrit and of ancient Indian history, art and archaeology. The author is widely read not only in ancient Indian literature but also the literature of aesthetics in general. Her interpretation of the philosophy of rasa is thought-provoking. Dr. Kapila Vatsyayan had published a comparative study of Indian dance in literature and art which remains a classic. So the work of Dr. Mukund Lah on Dattilam is a classic now. The present work of Dr. Anupa Pande may be confidently regarded as a worthy successor of these works.

S.P.GUPTA

148, Vigyan Vihar,
New Delhi.

INDIAN ARCHAEOLOGICAL SOCIETY

RECEIPTS AND PAYMENTS ACCOUNTS FOR THE YEAR ENDED 31-03-1992

Receipts		Payments	
By Opening Balances:		By Honorarium	12394-00
		By Puratattva	78005-00
Cash in hand	242-92	To Conference Expenditure	16892-00
Cash at Bank	138361-08	To Purchase of Machinery & Installation	140519-40
By Grant Received from Archaeological Survey of India	24500-00	To Building Account	92275-68
		To Purchase of Furniture	1000-00
By Receipt from Assam Museum	22750-00	To Printing of "Facets of Indian History Culture and Archaeology"	35120-00
By Receipt from Madhya Pradesh Govt.	1500000-00		
By Grant received from I.C.H.R.	14250-00	To Audit Fees	2500-00
By Grant received from National Museum	50000-00	To Postage	1515-00
By Grant received from various Govt. departments	83250-00	To Printing & Stationery	2990-85
		To Building Maintenance	4910-00
By sale of Publication	10405-00	To Award to Prof. B.B. Lal	21000-00
By Membership Fees	3570-00	To Miscellaneous Expenditure	4484-00
By Delegation Fee	1100-00	To Closing Balances:	
By Institutional Fee	1000-00	Cash in Hand	4925-07
By Life Membership Fees	16615-00	Cash at Bank	75391-20
By Intt. from Bank	39898-20	Fixed Deposits	1500000-00
By Fixed deposits realised with Intt.	87980-00		
	1993922-20		1993922-20

Sd/- K.N. Dikshit
GENERAL SECRETARY

Sd/- Shashi Asthana
TREASURER

For Rajan Sharma & Co.,
Chartered Accountants.

Sd/-
(RAJAN KUMAR SHARMA)
Prop.

Place: New Delhi

Date : 8-10-1992.

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a. reference to books should include author's name (surname in capitals followed by the initials), year of publication, title of the book (underllined), volume and edition, name of the publisher, if necessary place of publication and page numbers cited.

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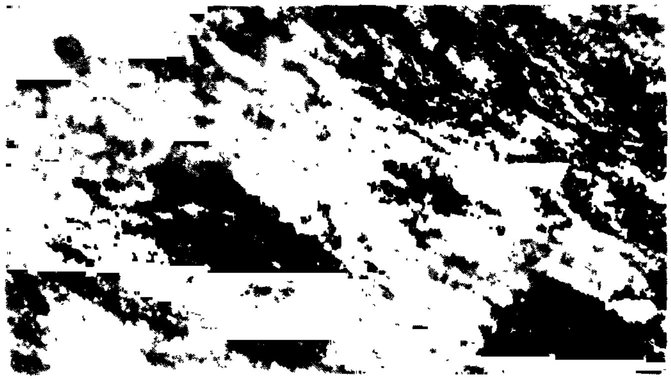
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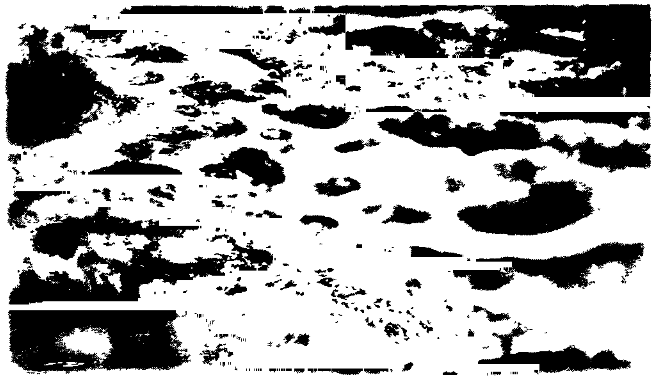
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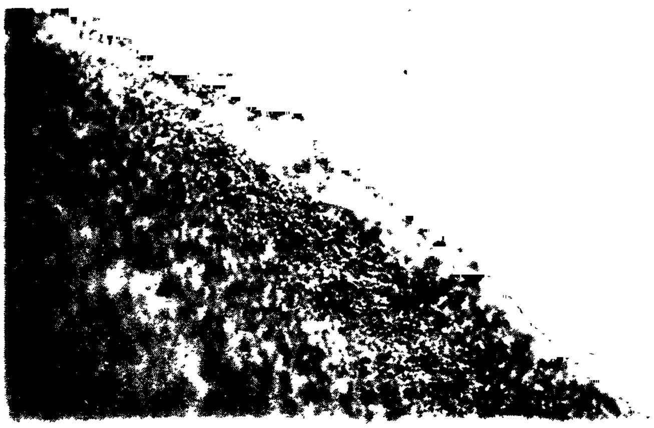
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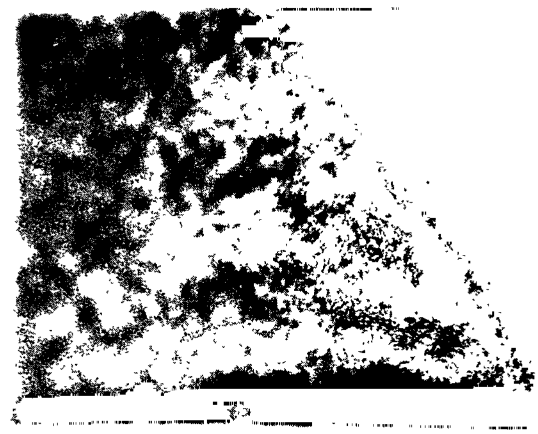
Pl. I. Experimental Plant Polish (Gayatri Chaturvedi)



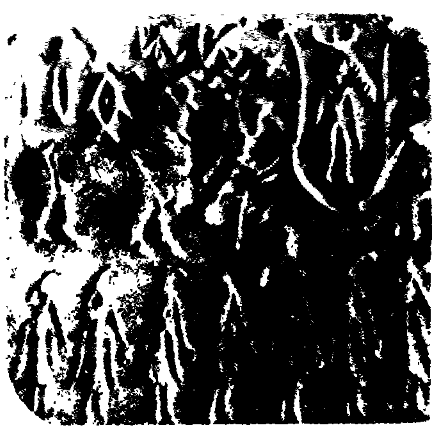
Pl. II. Experimental Sikle Gloss (Gayatri Chaturvedi)



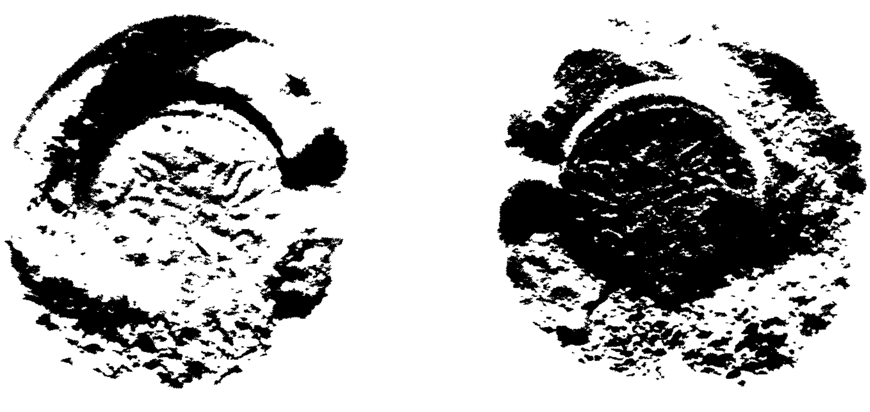
Pl. III. Archaeological meat/hide polish (Gayatri Chaturvedi)



Pl. IV. Experimental Fresh hide polish (Gayatri Chaturvedi)



Pl.V. Mohenjodaro : Three forms and seven figures (P.V. Pathak)



Pl.VI. Arambha : Coin mould (Amarendra Nath)



Pl. VII. Lal Kot : Excavated remains (B.R.Mani)



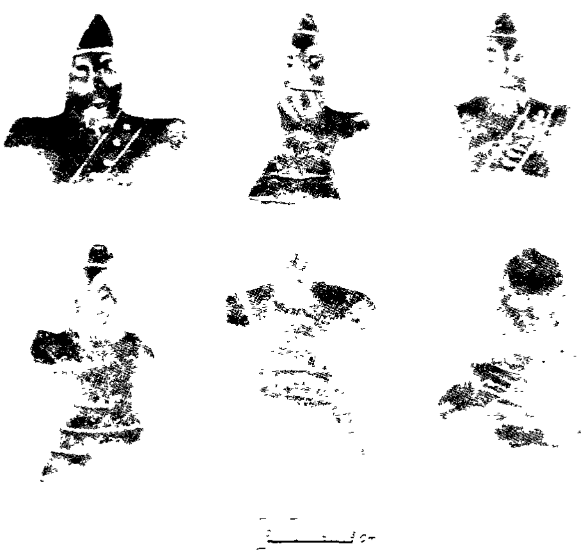
Pl. VIII. Lal Kot: Potshered with Brāhmī letters and Painted Grey Ware. (B.R. Mani)



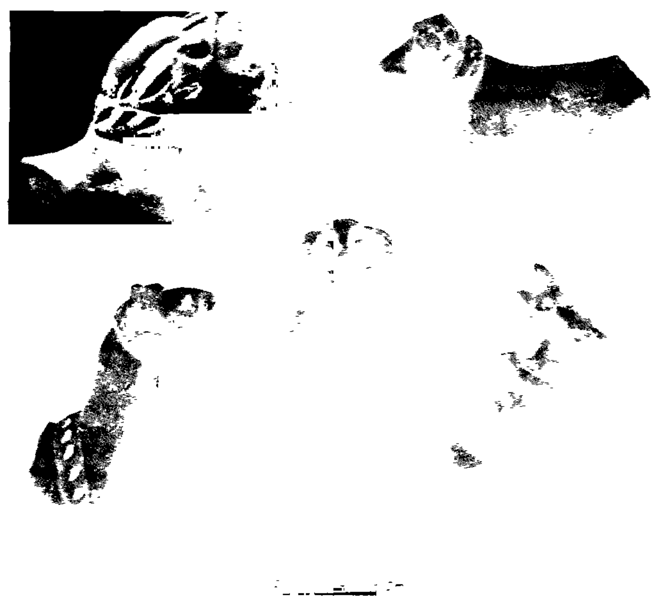
Pl. IX. Lal Kot : Stone figure of Varāha (B.R. Mani)



Pl. X. Lal Kot : LKT-1 with steps of Anang Tal and other excavated structures (B.R. Mani)



Pl. XI. Lal Kot : Terracotta human figurines (B.R. Mani)



Pl. XII. Lal Kot : Terracotta animal figurines (B.R. Mani)



Pl. XIII Vadagokugiri : Stupa (A.K. Sharma)



Pl. XIV Vadagokugiri : Dancing figure (A.K. Sharma)



Pl. XV. Vadagokugiri . Saraswatī (A.K. Sharma)



Pl XVI Vadagokugiri : Arjuna in penance (A.K Sharma)



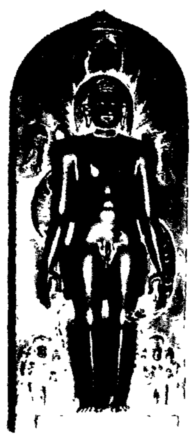
Pl. XVII. Vadagokugiri : Brahmā (A.K. Sharma)



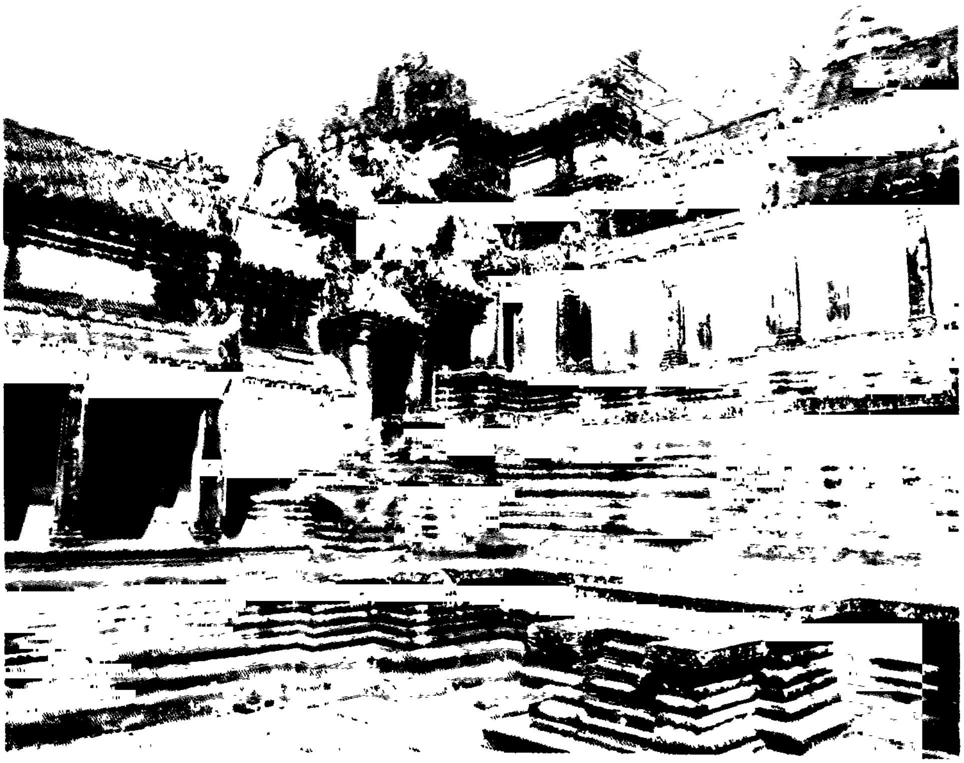
Pl. XVIII. Vadagokugiri . Octagonal Śiva temple (A K. Sharma)



Pl. XIX. Pārśvanātha : Ajitanātha temple (A. Gurumurthi)



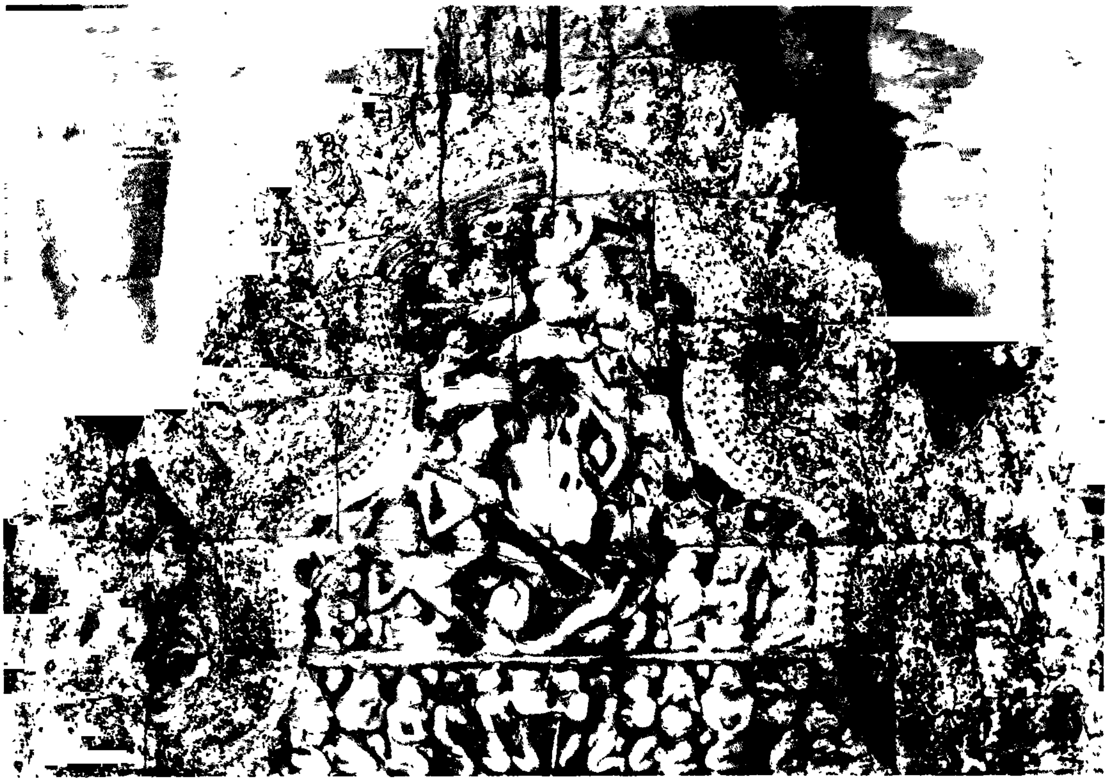
Pl. XX. Pārśvanātha : Pārsvanātha temple (A. Gurumurthi)



Pl. XXI. Angkor Vat : North-east corner of South east tank of second enclosure - Before Chemical treatment (B. Narasimhaiah)



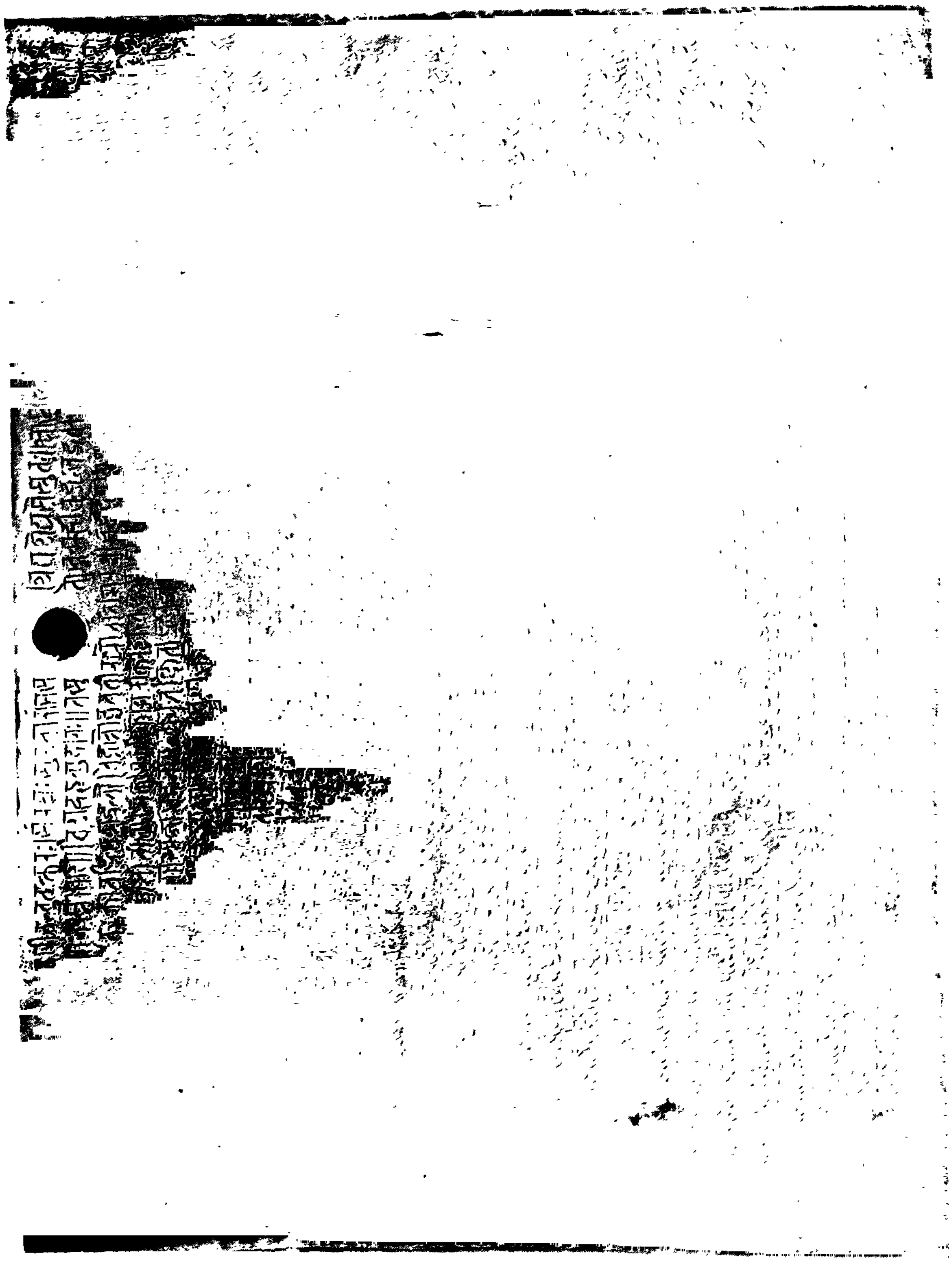
Pl. XXII Angkor Vat : North east corner of South-east tank of second enclosure-After Chemical treatment (B. Narasimhaiah)



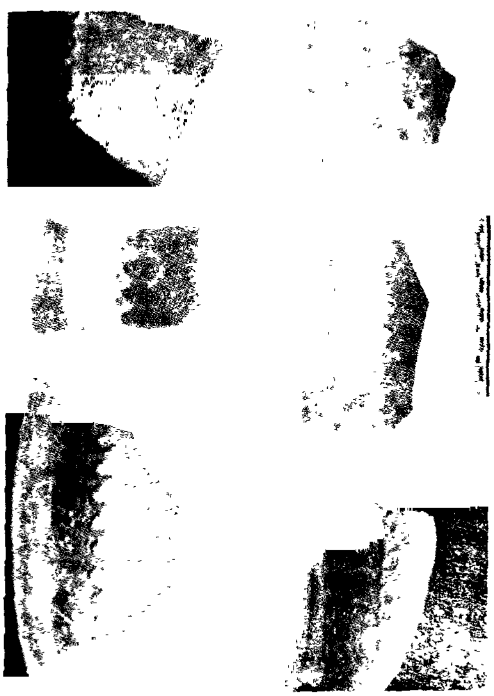
Pl. XXIII. Angkor Vat : Decorative toraṇa of second enclosure- Before chemical treeatment (B. Narasimhaiah)



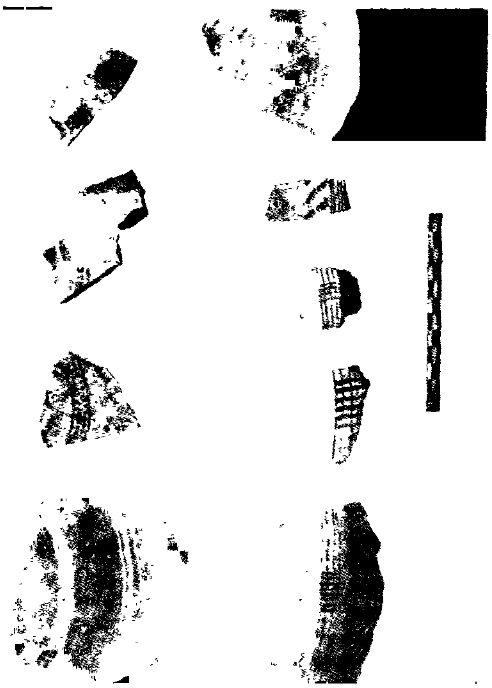
Pl. XXIV. Angkor Vat : Decorative torana of second enclosure- After chemical treatment (B. Narasimhaiah)



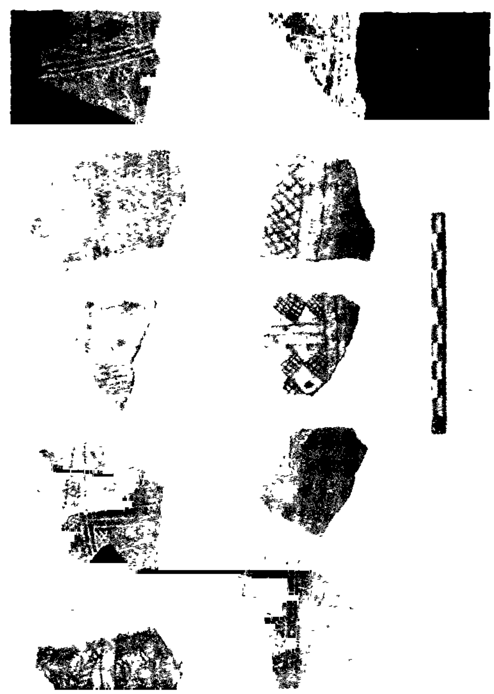
Pl. XXV. Kamauli Copper Plate Inscription (A.K. Singh)



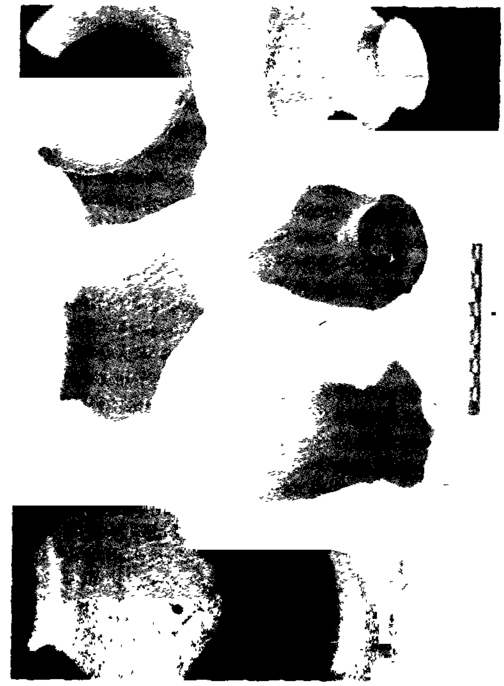
Pl. XXVI. Imlidih : Corded Ware with applique designs (P. Singh *et al.*)



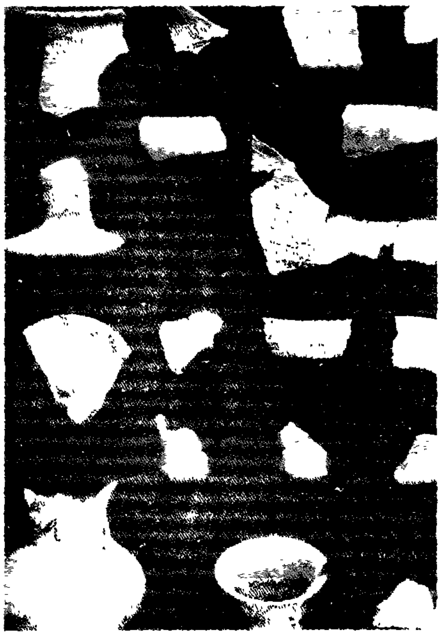
Pl. XXVII. Imlidih : Corded Ware (Painted) (P. Singh *et al.*)



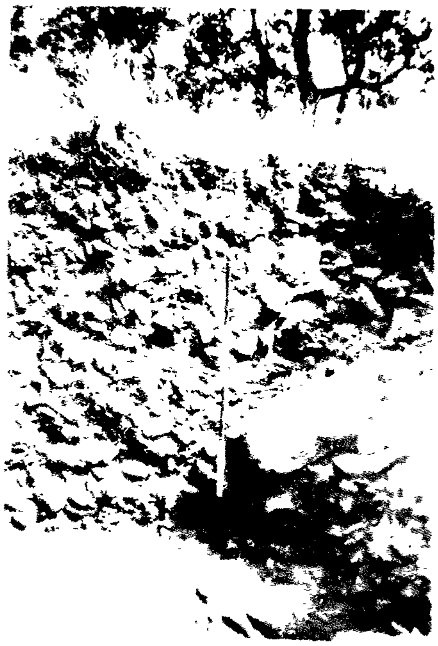
Pl. XXVIII. Imlidih : Corded Ware with incised designs (P. Singh *et al.*)



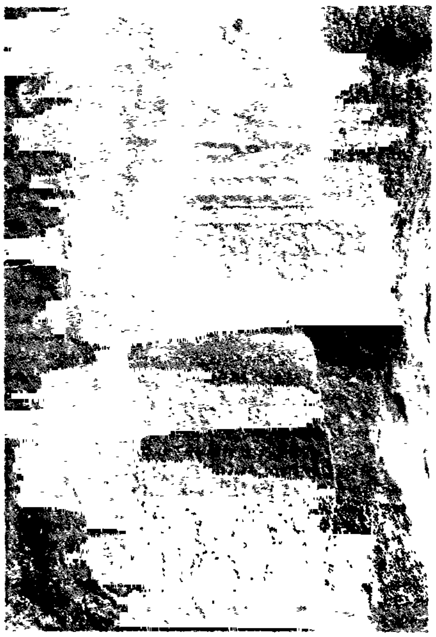
Pl. XXIX. Imlidih : Corded Ware (P. Singh *et al.*)



Pl. XXX Kotra : Painted Malwa Pottery (C.B. Trivedi)



Pl. XXXI. Sulbhdihi : Section (Pradeep K. Behera)



Pl. XXXII. Art relief at Ajanta (S.K. Mittra).



Pl. XXXIII. Padmapāṇi sculpture from Western Himalayas (A.K. Singh *et al*)